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Parts Manual

Cummins **Onan**

Performance you rely on.™



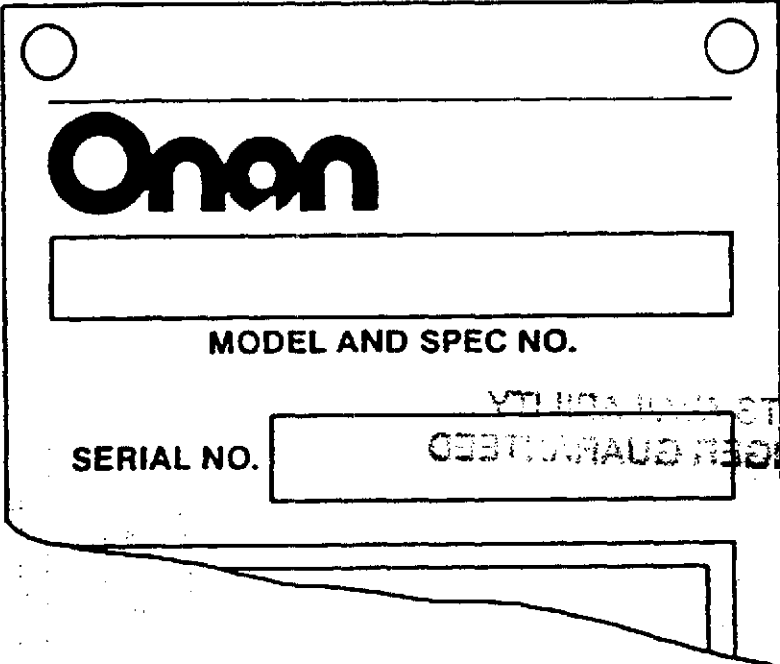
Diesel Genset

DFP / LDFP

General Information

For parts or service, contact the dealer from whom you purchased this equipment or refer to your Nearest Authorized Onan Parts and Service Center.

To avoid errors or delay in filling your parts order, always give the MODEL, SPEC NO. and SERIAL NO. from the Onan nameplate.



The diagram shows a rectangular nameplate with two circular mounting holes at the top. The Onan logo is at the top left. Below it is a large rectangular box labeled "MODEL AND SPEC NO.". Below that is a smaller rectangular box labeled "SERIAL NO.". To the right of the "SERIAL NO." box, there is a stamp that reads "NO LONGER GUARANTEED" and "PARTS QUALITY".

Onan

MODEL AND SPEC NO.

SERIAL NO.

NO LONGER GUARANTEED

PARTS QUALITY

M-1149

For handy reference, insert "YOUR" nameplate information in the spaces above.

Important Safety Precautions

Read and observe these safety precautions when using or working on electric generators, engines and related equipment. Also read and follow the literature provided with the equipment.

Proper operation and maintenance are critical to performance and safety. Electricity, fuel, exhaust, moving parts and batteries present hazards that can cause severe personal injury or death.

FUEL, ENGINE OIL, AND FUMES ARE FLAMMABLE AND TOXIC

Fire, explosion, and personal injury can result from improper practices.

- Used engine oil, and benzene and lead, found in some gasoline, have been identified by government agencies as causing cancer or reproductive toxicity. When checking, draining or adding fuel or oil, do not ingest, breathe the fumes, or contact gasoline or used oil.
- Do not fill tanks with engine running. Do not smoke around the area. Wipe up oil or fuel spills. Do not leave rags in engine compartment or on equipment. Keep this and surrounding area clean.
- Inspect fuel system before each operation and periodically while running.
- Equip fuel supply with a positive fuel shutoff.
- Do not store or transport equipment with fuel in tank.
- Keep an ABC-rated fire extinguisher available near equipment and adjacent areas for use on all types of fires except alcohol.
- Unless provided with equipment or noted otherwise in installation manual, fuel lines must be copper or steel, secured, free of leaks and separated or shielded from electrical wiring.
- Use approved, non-conductive flexible fuel hose for fuel connections. Do not use copper tubing as a flexible connection. It will work-harden and break.

EXHAUST GAS IS DEADLY

- Engine exhaust contains carbon monoxide (CO), an odorless, invisible, poisonous gas. Learn the symptoms of CO poisoning.
- Never sleep in a vessel, vehicle, or room with a genset or engine running unless the area is equipped with an operating CO detector with an audible alarm.
- Each time the engine or genset is started, or at least every day, thoroughly inspect the exhaust system. Shut down the unit and repair leaks immediately.

- Warning: Engine exhaust is known to the State of California to cause cancer, birth defects and other reproductive harm.

Make sure exhaust is properly ventilated.

- Vessel bilge must have an operating power exhaust.
- Vehicle exhaust system must extend beyond vehicle perimeter and not near windows, doors or vents.
- Do not use engine or genset cooling air to heat an area.
- Do not operate engine/genset in enclosed area without ample fresh air ventilation.
- Expel exhaust away from enclosed, sheltered, or occupied areas.
- Make sure exhaust system components are securely fastened and not warped.

MOVING PARTS CAN CAUSE SEVERE PERSONAL INJURY OR DEATH

- Do not remove any guards or covers with the equipment running.
- Keep hands, clothing, hair, and jewelry away from moving parts.
- Before performing any maintenance, disconnect battery (negative [-] cable first) to prevent accidental starting.
- Make sure fasteners and joints are secure. Tighten supports and clamps, keep guards in position over fans, drive belts, etc.
- If adjustments must be made while equipment is running, use extreme caution around hot manifolds and moving parts, etc. Wear safety glasses and protective clothing.

BATTERY GAS IS EXPLOSIVE

- Wear safety glasses and do not smoke while servicing batteries.
- Always disconnect battery negative (-) lead first and reconnect it last. Make sure you connect battery correctly. A direct short across battery terminals can cause an explosion. Do not smoke while servicing batteries. Hydrogen gas given off during charging is explosive.
- Do not disconnect or connect battery cables if fuel vapors are present. Ventilate the area thoroughly.

DO NOT OPERATE IN FLAMMABLE AND EXPLOSIVE ENVIRONMENTS

Flammable vapor can be ignited by equipment operation or cause a diesel engine to overspeed and become difficult to stop, resulting in possible fire, explosion, severe personal injury and death. **Do not operate diesel equipment where a flammable vapor environment can be created by fuel spill, leak, etc., unless equipped with an automatic safety device to block the air intake and stop the engine.**

HOT COOLANT CAN CAUSE SEVERE PERSONAL INJURY

- Hot coolant is under pressure. Do not loosen the coolant pressure cap while the engine is hot. Let the engine cool before opening the pressure cap.

ELECTRICAL SHOCK CAN CAUSE SEVERE PERSONAL INJURY OR DEATH

- Do not service control panel or engine with unit running. High voltages are present. Work that must be done while unit is running should be done only by qualified service personnel.
- Do not connect the generator set to the public utility or to any other electrical power system. Electrocutation can occur at a remote site where line or equipment repairs are being made. An approved transfer switch must be used if more than one power source is connected.
- Disconnect starting battery (negative [-] cable first) before removing protective shields or touching electrical equipment. Use insulative mats placed on dry wood platforms. Do not wear jewelry, damp clothing or allow skin surface to be damp when handling electrical equipment.
- Use insulated tools. Do not tamper with interlocks.
- Follow all applicable state and local electrical codes. Have all electrical installations performed by a qualified licensed electrician. Tag open switches to avoid accidental closure.
- With transfer switches, keep cabinet closed and locked. Only authorized personnel should have cabinet or operational keys. Due to serious shock hazard from high voltages within cabinet, all service and adjustments must be performed by an electrician or authorized service representative.

If the cabinet must be opened for any reason:

1. Move genset operation switch or Stop/Auto/Handcrank switch (whichever applies) to Stop.
2. Disconnect genset batteries (negative [-] lead first).
3. Remove AC power to automatic transfer switch. If instructions require otherwise, use extreme caution due to shock hazard.

MEDIUM VOLTAGE GENERATOR SETS (601V TO 15kV)

- Medium voltage acts differently than low voltage. Special equipment and training are required to work on or around medium voltage equipment. Operation and maintenance must be done only by persons trained and qualified to work on such devices. Improper use or procedures will result in severe personal injury or death.
- Do not work on energized equipment. Unauthorized personnel must not be permitted near energized equipment. Induced voltage remains even after equipment is disconnected from the power source. Plan maintenance with authorized personnel so equipment can be de-energized and safely grounded.

GENERAL SAFETY PRECAUTIONS

- Do not work on equipment when mentally or physically fatigued or after consuming alcohol or drugs.
- Carefully follow all applicable local, state and federal codes.
- Never step on equipment (as when entering or leaving the engine compartment). It can stress and break unit components, possibly resulting in dangerous operating conditions from leaking fuel, leaking exhaust fumes, etc.
- Keep equipment and area clean. Oil, grease, dirt, or stowed gear can cause fire or damage equipment by restricting airflow.
- Equipment owners and operators are solely responsible for operating equipment safely. Contact your authorized Onan/Cummins dealer or distributor for more information.

KEEP THIS DOCUMENT NEAR EQUIPMENT FOR EASY REFERENCE.

DO NOT REMOVE

SUPPLEMENT 960-1006

This supplement applies to the LDFF series generator sets and should be used in place of or in addition to information given in the DFP series Operator's Manual 960-0122 and DFP Parts Catalog 960-0222.

OPERATOR'S MANUAL

SPECIFICATIONS SECTION

	156 kW (50 Hz)	176 kW (50 Hz)	209 kW (60 Hz)
Engine Details			
Gross Continuous Output	198 kW (265 bhp) @ 1500 r/min.	198 kW (265 bhp) @ 1500 r/min.	239 kW (320 bhp) @ 1800 r/min.
Generator Set Details			
Rating (Continuous)	156 kW (195 kVA)* 146 kW (182.5 kVA)**	176 kW (220 kVA)* 174 kW (217.5 kVA)**	209 kW (261 kVA)* 207 kW (259 kVA)**
Air Requirements			
Radiator-Cooled Engine	385 m ³ /min (13600 CFM)	385 m ³ /min (13600 CFM)	487 m ³ /min (17210 CFM)
Average Fuel Consumption			
At Rated Load with No. 2 Diesel Fuel	47.3 L/hr (12.5 gph)	53.4 L/hr (14.1 gph)	67. L/hr (17.7 gph)
General			
Approximate Mass (Weight)	2690 kg (5930 lb)	2767 kg (6100 lb)	2767 kg (6100 lb)

* At 0.8 PF with ambient temperature of 29.4 C, 152.4 metres above sea level and 50 percent relative humidity.

** At 0.8 PF with ambient temperature of 50 C, 1000 metres above sea level and 50 percent relative humidity.

DESCRIPTION SECTION

Control Panel

Panel Light and Panel Light Switch: The LDFF includes an instrument panel light and panel light switch. The light remains lit whether or not the generator set operates if the panel light switch is left in the on position.

Panel Fuse: A five-ampere fuse is located on the front of the control panel. It protects the DC control components if a short should occur.

OPERATION SECTION

Fuses

DC Fuse: If the DC fuse in the control panel should burn out, check for a DC short in the control box and remedy. Use a Bussman MTH5 fuse (rated 5 amperes, 250 volts) or equivalent.

AC Fuse: Fuse blocks in the control housing interior where the load connections are made contain five fuses for protection of the alternator from shorts in the control box. If a fuse burns out, find the cause and remedy before replacing the fuse. Be sure to remove the battery ground cable and turn the operation selector switch to "STOP" before beginning inspection. Use a Bussman SC15 fuse (rated 15 amperes, 300 volts, 100 kA interrupting capacity) or equivalent.

WARNING

Failure to disable the generator set during this procedure results in a serious shock hazard if accidental generator set starting occurs.

GENERAL MAINTENANCE SECTION

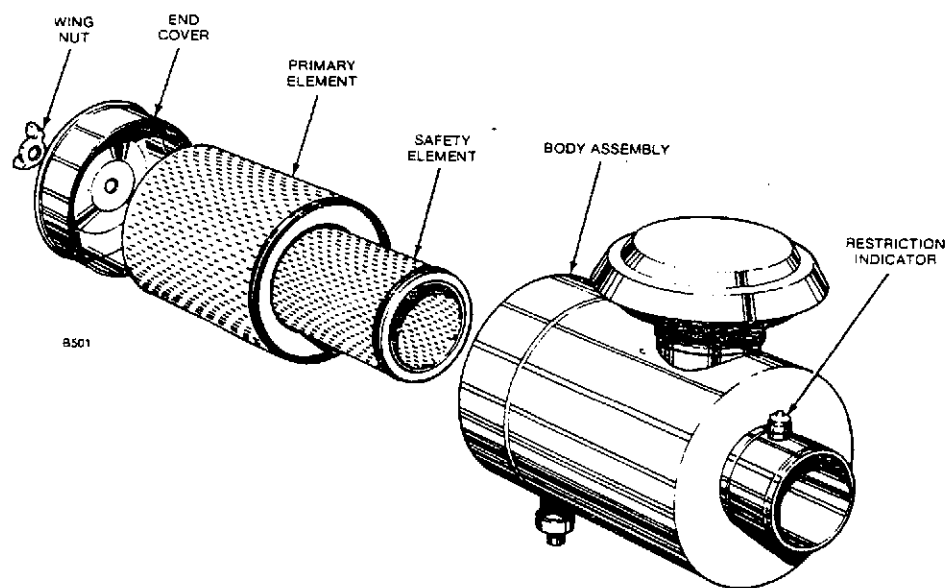
Air Cleaner Maintenance

Use the time intervals specified in the operator maintenance schedule in the operator's manual for checking the air cleaner element (unless the air cleaner service indicator exhibits the red signal with the engine shut off, then service immediately). Follow this procedure for servicing the air cleaner.

1. Remove the wing nut and end cover from the air cleaner assembly.
2. Remove the primary element from the air cleaner but do not remove the safety element (read Step 3).
 - a. Blow dry compressed air (207 kPa or 30 psi maximum) through the primary element from the inside (clean side). Hold air nozzle at least 25 mm (one inch) away.
 - b. Soak the primary element for at least 15 minutes in water and Donaldson's D1400 solvent to remove soot and carbon as well as dirt. Rinse until water is clear (use low pressure water) and air dry. Do not use compressed air.

Compressed air is recommended if the element must be used immediately after cleaning since the primary element must be dry before use.

- c. Replace the primary element after six cleanings or annually, whichever occurs first.
3. With every third primary element change, replace the safety element.
 - a. Remove safety element from the air cleaner.
 - b. Wipe out the air cleaner interior and inspect the air cleaner.
4. Check the air cleaner and air cleaner tube to engine for leaks. Be sure clamps are tight and that tubing and joints have no leaks.
5. If the safety element was removed for replacement, wipe the seal on the new safety element and install making sure it seats properly.
6. Install the primary element so it seats properly and then secure with the end cover and wing nut.
7. Push the button on the air cleaner service indicator to reset.



SUPPLEMENTARY PARTS LIST

This Supplementary Parts List Applies to the Standard LDFP Models listed below. Use these parts in place of/or in addition to those listed in the Main Parts Catalog, 960-0222.

SET DATA TABLE

MODEL AND SPEC NO #	ELECTRICAL DATA			
	WATTS	WIRE	HERTZ*	PHASE
156.0 LDFP-517R	156,000	*	50	3
176.0 LDFP-517R	176,000	*	50	3
309.0 LDFP-17R	209,000	*	60	3

* - These sets are Broad Range Reconnectable; Refer to Wiring Diagram inside Control Box Cover.

- The Specification Letter Advances (A to B, B to C, etc.) with Manufacturing Changes.

100-1578 1 Engine, Replacement

MISCELLANEOUS ENGINE PARTS

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
19 Through - 30	DELETE	-	See separate group for Air Cleaner and associated parts.
60	338-1161	1	Harness, Engine Wiring (Includes Parts Marked +)
62	330-0093	1	+ Box, Outlet
63	330-0099	1	+ Cover Assembly, Outlet Box
64	330-0094	1	+ Box, Outlet
65	330-0004	1	+ Cover, Outlet Box
66	508-0001	1	+ Grommet
67	508-0009	1	+ Grommet
68	331-0149	3	+ Connector
69	331-0150	3	+ Connector
70	508-0201	4	+ Bushing
71	508-0202	4	+ Bushing
72	331-0190	1	+ Conduit, Flex
73	331-0146	1	+ Conduit, Flex
74	331-0184	1	+ Conduit, Flex
75	331-0167	1	+ Conduit, Flex
76	338-0989	1	+ Harness, Governor
77	330-0097	1	+ Bracket, Mounting
78	821-0010	2	+ Screw, Cap - Locking Head ($\frac{1}{4}$ -20 X $\frac{1}{2}$ " Long)
79	331-0180	6	+ Strap, Half

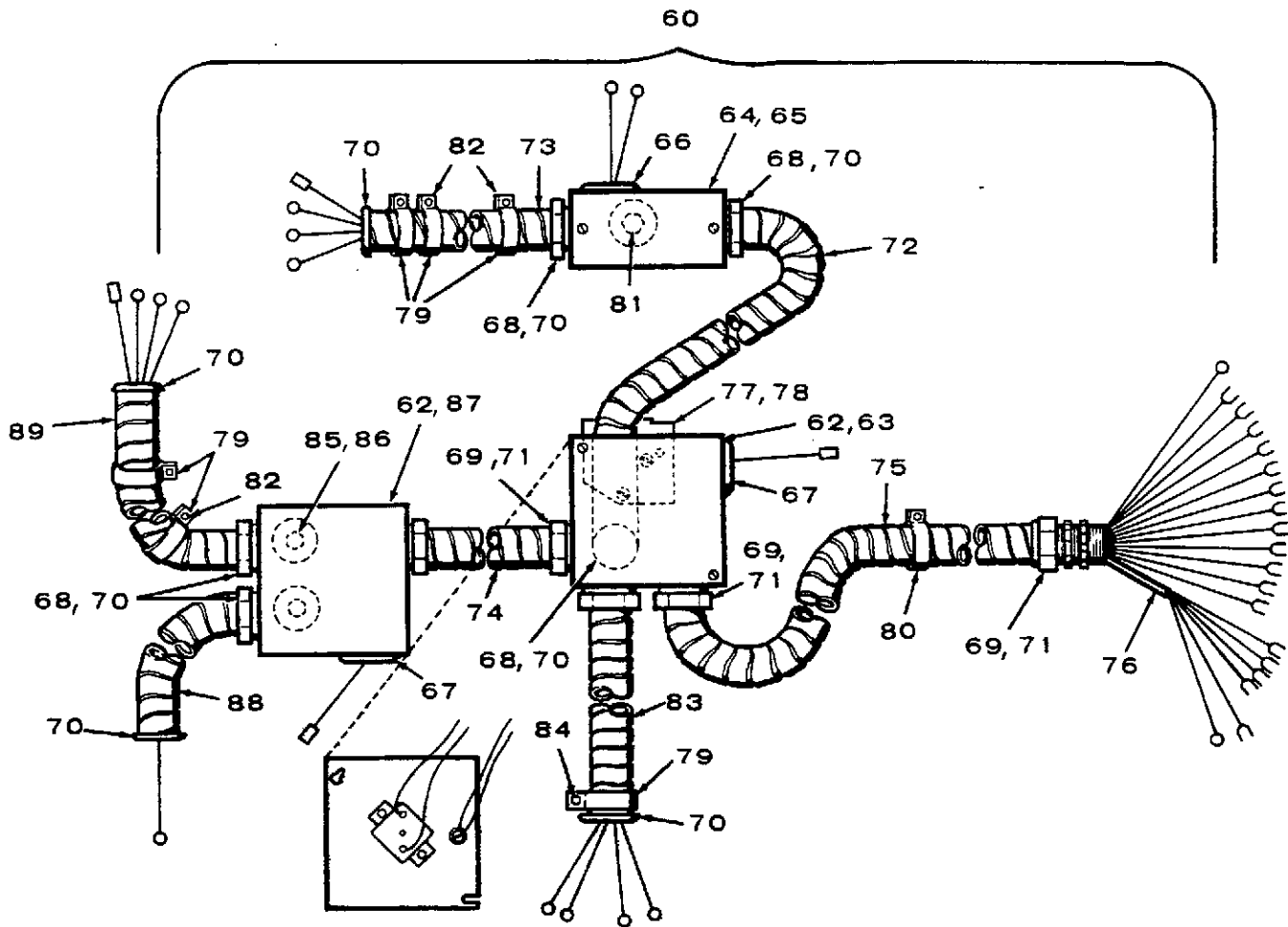
MISCELLANEOUS ENGINE PARTS

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
80	331-0181	1	+ Strap, Half
81	800-0088	1	+ Screw, Cap - Hex Head - (1/2-13 X 3/4" Lg.)
82	800-0048	3	+ Screw, Cap - Hex Head - (3/8-16 X 3/4" Lg.)
83	331-0155	1	+ Conduit, Flex
84	801-0048	1	+ Screw, Cap - Hex Head - (3/8-24 X 3/4" Lg.)
85	801-0099	2	+ Screw, Cap - Hex Head - (9/16-18 X 3/4" Lg.)
86	526-0198	3	+ Washer, Flat (5/8 ID X 1-1/2" OD X 1/16" Thk)
87	330-0100	1	+ Cover, Outlet Box
88	331-0160	1	+ Conduit, Flex
89	331-0182	1	+ Conduit, Flex
90	331-0153	6	+ Washer, Reducer
91	330-0117	1	+ Bracket, Box Mtg.
92	330-0116	1	+ Bracket, Box Mtg.
93	870-0212	5	+ Nut (1/4-20)
94	850-0060	2	+ Washer, Lock-Spring (1/2")
95	505-0022	1	+ Bushing, Reducer
	151-0423	1	* Actuator, Governor (B.C. #11003-0-0-24)
	151-0399	1	* Control (Includes Mtg. Screw) - (B.C. #DYN1-1000-2-0-24)
	151-0441	1	* Lower, Actuator (B.C. #DYNC-208)
	151-0442	1	* Tod, Threaded (B.C. #GYRF-43-1)
	151-0443	2	* Bearing, Rod End (B.C. #DYNZ-47-2)
	151-0411	1	* Pickup, Magnetic (B.C. #DYNT-10200)
		1	* Bracket, Actuator Mtg. (B.C. #DYNZ-68)
96	309-0272	1	Switch, Oil Pressure - Pre-Alarm

* - Check for Barber-Colman numbers when ordering parts.

+ - Parts Included in 338-1161 Wiring Harness.

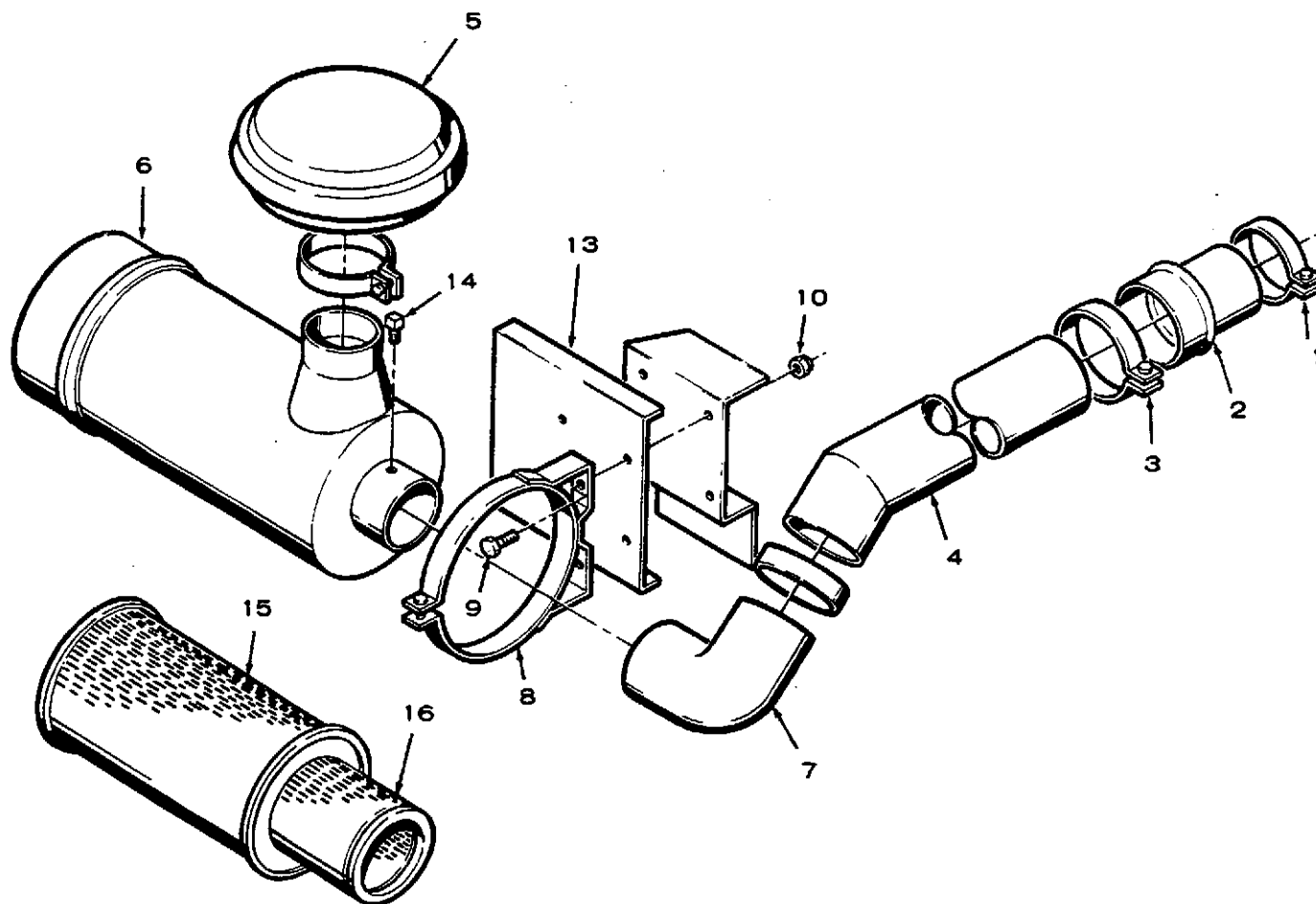
MISCELLANEOUS ENGINE PARTS



AIR CLEANER PARTS

<u>REF NO.</u>	<u>PART NO.</u>	<u>QTY. USED</u>	<u>PART DESCRIPTION</u>
1	503-0863	1	Clamp, Hose
2	503-0862	1	Reducer, Tube
3	503-0864	3	Clamp, Hose
4	140-1544	1	Tube, Air Cleaner
5	140-1545	1	Hood, Air Inlet
6	140-1537	1	Cleaner, Air (Includes Elements)
7	503-0861	1	Elbow
8	140-0757	2	Clamp, Air Cleaner
9	800-0050	6	Screw, Cap-Hex Head - (3/8-16 X 1" LG)
10	870-0281	6	Nut, Hex-Self Locking - (3/8-16)
11	801-0119	2	Screw, Cap-Hex Head - (5/8-18 X 1" LG)
12	850-0070	2	Washer, Lock-Spring - (5/8")
13	140-1546	1	Bracket, Air Cleaner
14	140-1548	1	Indicator, Service
15	140-1631	1	Element, Air Cleaner (Primary)
16	140-1630	1	Element, Air Cleaner (Safety)

AIR CLEANER PARTS



COOLING SYSTEM

<u>REF. NO.</u>	<u>PART NO.</u>	<u>QTY. USED</u>	<u>PART DESCRIPTION</u>
1	130-1240	1	Radiator (Includes Cap
2	130-0843	2	Bracket, Radiator Support
4	130-1304	1	Hose, Radiator (Outlet)
5	503-0908	4	Clamp, Radiator Hose
6	130-1330	1	Shroud, Radiator - Fan
11	130-1305	1	Hose, Radiator - (Inlet)
27	405-2016	2	Bracket, Panel Mtg.
28	503-0904	2	Hose, Inlet
29	503-0907	4	Clamp, Hose
30	503-0906	2	Hose, Outlet

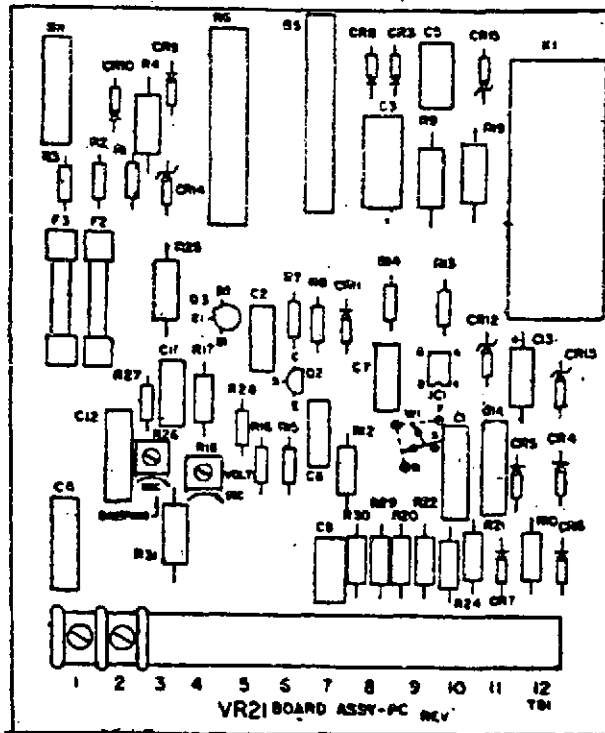
CONTROL (AC PORTION)

<u>REF. NO.</u>	<u>PART NO.</u>	<u>QTY. USED</u>	<u>PART DESCRIPTION</u>
1	301-4668	1	Box, Control
22	332-2044	1	Regulator Board, Voltage (See Separate Group for Components)
35	321-0223	5	Fuse - 15 Ampere
36	321-0177	1	Holder, Fuse
37	321-0176	1	Holder, Fuse
38	338-1104	1	Harness, Wiring

GENERATOR

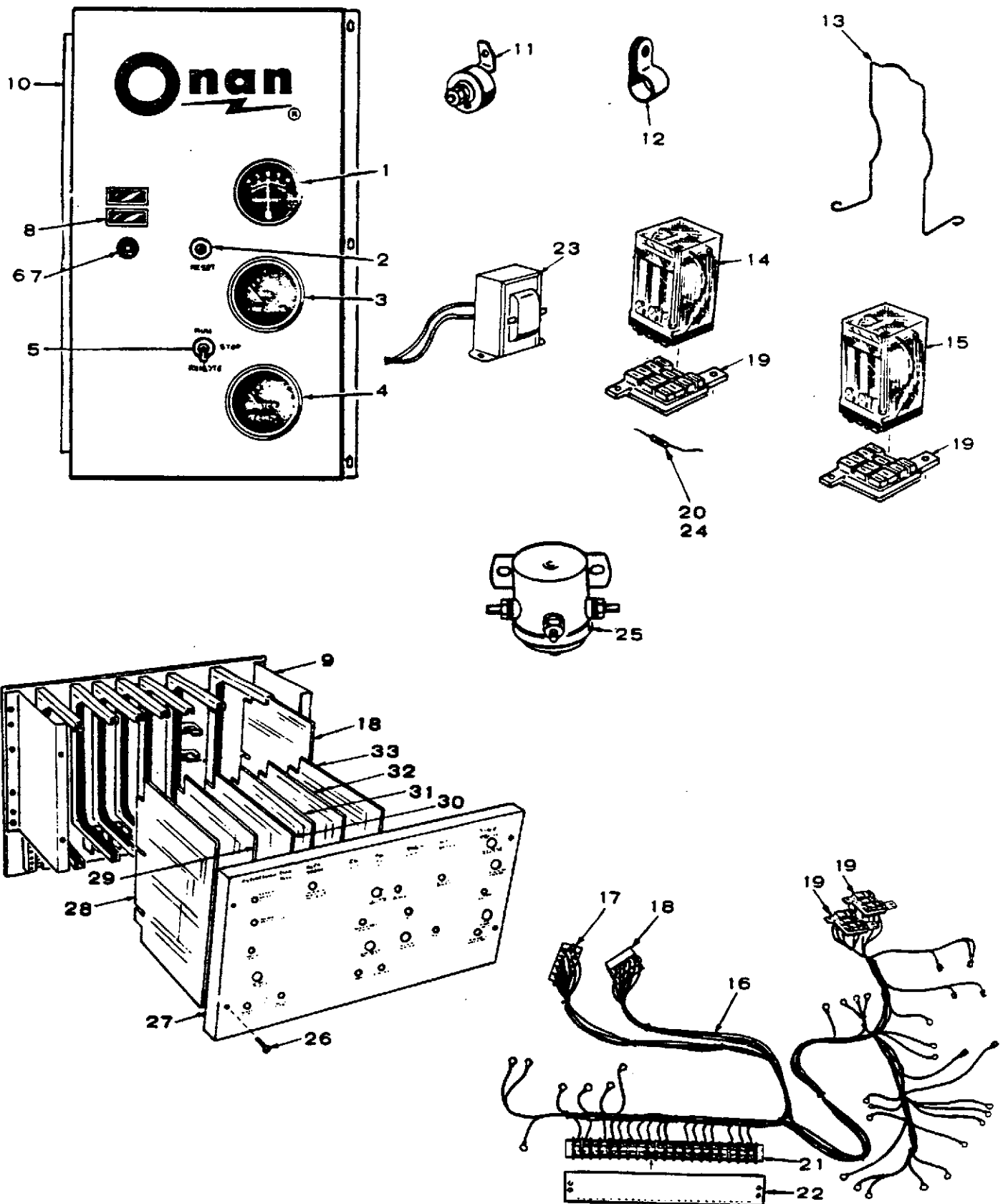
<u>REF. NO.</u>	<u>PART NO.</u>	<u>QTY. USED</u>	<u>PART DESCRIPTION</u>
1	201-1941	1	Rotor, Wound
14	Stator, Wound (Includes Bus Bars)		
	220-2136	1	50 Hertz
	220-1912	1	60 Hertz
33	509-0151	1	Seal "O" Ring

VOLTAGE REGULATOR BOARD ASSEMBLY



REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
	332-1954	1	Printed Circuit Board
C1,14	355-0042	2	Capacitor - .47 Mfd., 250 Volt
C2,7	355-0043	2	Capacitor - .22 Mfd, 250 Volt
C3	355-0047	1	Capacitor - .47 Mfd, 400 Volt
C4,12	355-0044	2	Capacitor - .47 Mfd, 250 Volt
C5,8	355-0046	2	Capacitor - 1 Mfd, 100 Volt
C6	355-0056	1	Capacitor - .33 Mfd, 250 Volt
C11	355-0048	1	Capacitor - .1 Mfd, 400 Volt
C13	356-0039	1	Capacitor - Electrolytic, 100 Mfd, 10 Volt
CR3 thru 11	357-0014	9	Rectifier - Silicon
CR12	359-0036	1	Diode, Zener - 5.6 Volt
CR13	359-0025	1	Diode, Zener - 20 Volt
CR14	359-0026	1	Diode, Zener - 18 Volt
F1,2,3	321-0204	3	Fuse - 1.4 Amp
IC1	367-0005	1	Integrated Circuit
Q2	362-0017	1	Transistor - Silicon (NPN)
Q3	361-0004	1	Transistor - Unijunction
R1	350-0355	1	Resistor - 1/2 Watt, 47-Ohm
R2,3	350-0351	2	Resistor - 1/2 Watt, 33-Ohm
R4	350-1075	1	Resistor - 2 Watt, 4,700,000-Ohm
R5	353-0040	1	Resistor, Fixed - 10 Watt, 270-Ohm
R6	353-0039	1	Resistor, Fixed - 15 Watt, 5,000-Ohm
R7	350-0398	1	Resistor - 1/2 Watt, 3,000-Ohm
R8,16	350-0447	2	Resistor - 1/2 Watt, 330,000-Ohm
R10	351-0885	1	Resistor - 1/2 Watt, 51,000-Ohm
R11	352-0151	1	Resistor, Fixed - 5 Watt, 15,000-Ohm
R12	351-0909	1	Resistor - 1/2 Watt, 90,900-Ohm
R13	350-0411	1	Resistor - 1/2 Watt, 10,000-Ohm
R14	350-0443	1	Resistor - 1/2 Watt, 220,000-Ohm
R15,27	350-0435	2	Resistor - 1/2 Watt, 100,000-Ohm
R17	351-0293	1	Resistor - Metal Film - 1/4 Watt, 11,000-Ohm
R18	303-0210	1	Potentiometer - 1/2 Watt, 5,000-Ohm
R20,22,29 & 30	351-0520	4	Resistor - 1/4 Watt, 28,000-Ohm
R21	351-0522	1	Resistor, Metal Film - 1/4 Watt, 5,110,000-Ohm
R24	351-0523	1	Resistor, Metal Film - 1/4 Watt, 8,870,000-Ohm
R25,31	350-1011	2	Resistor - 2 Watt, 10,000-Ohm
R26	303-0211	1	Potentiometer - 1/2 Watt, 100,000-Ohm
R28	350-0588	1	Resistor - 1/2 Watt
TB1	332-1252	1	Terminal Block
CR15	359-0015	1	Diode, Zener - 24 Volt
	321-0163	6	Clip - Fuse
K1	307-1063	1	Relay - Magnetic Reed
R9	350-1014	1	Resistor - 2 Watt, 13,000-Ohm
R19	350-1007	1	Resistor - 2 Watt, 6,800-Ohm

CONTROL (ENGINE SECTION)



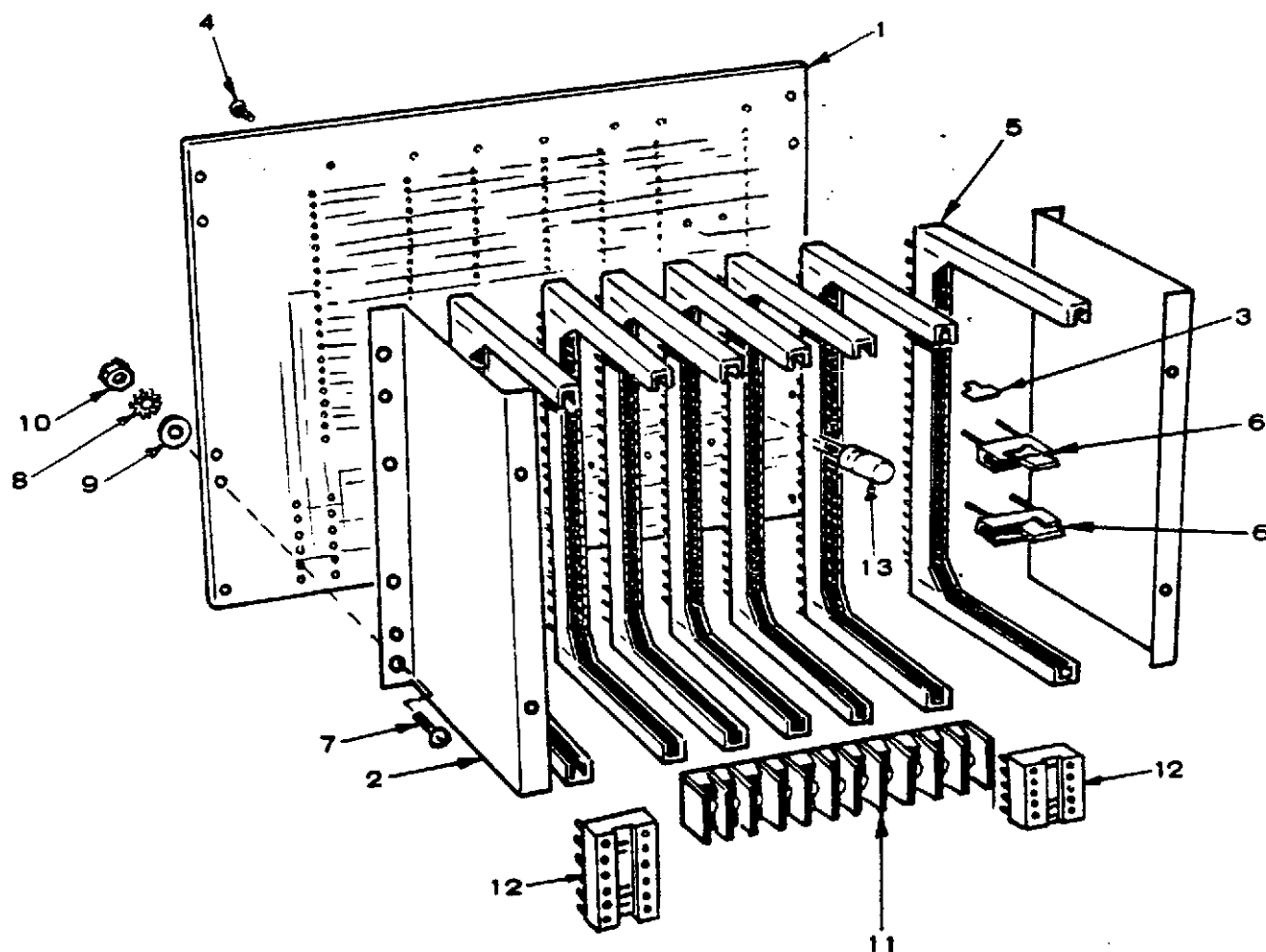
CONTROL (ENGINE SECTION)

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION	REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	302-0061	1	Ammeter (30-0-30)	16	338-1016	1	Harness, Wiring (Includes Parts Marked †)
2	308-0410	1	Switch, Push	17	332-0984	2	†Connector, Plug, Electrical (12 Pin)
3	193-0243	1	Gauge, Oil Pressure (0-80)	18	300-1579	1	*Module, Time Delay Start-Stop
4	193-0245	1	Gauge, Water Temperature	19	323-0765	2	†Socket, Relay
5	SWITCH, TOGGLE			20	357-0004	1	†Diode
	308-0220	1	Standard Sets	21	332-1005	1	†Board, Terminal (20 Place)
	308-0347	1	Penn State Sets	22	332-1559	1	Strip, Marker
6	321-0147	1	Fuse - 5 Amp	23	315-0361	1	Transformer, Step-down
7	321-0217	1	Fuseholder	24	357-0004	2	Diode
8	LIGHT, INDICATOR			25	307-0061	1	Relay - Start Solenoid
	322-0119	1	Overcrank	26	815-0387	4	Screw, Machine - Pan Head, Cross-Recessed Drive (#6-32 x 1/4")
	322-0120	1	Low Oil Pressure	27	301-4015	1	Cover, Access - Control Modules
	322-0121	1	High Engine Temperature	28	300-1573	1	*Module, Cycle Cranker
	322-0122	1	Low Engine Temperature	29	300-1574	1	*Module, Start-Disconnect
	322-0123	1	Overspeed	30	300-1575	1	*Module, Overspeed Control
	322-0135	1	Over Voltage	31	300-1576	1	*Module, Monitor No. 1
9	300-1572	1	*Chassis, Control	32	300-1577	1	*Module, Monitor No. 2
10	301-4692	1	Panel, Control	33	300-1578	1	*Module, Engine Shutdown
11	193-0250	2	Resistor, Gauge				
12	332-0052	1	Clamp, Loop				
13	307-1157	2	Spring, Hold-down - Relay				
14	307-1061	1	Relay, Armature - Starter Protection				
15	307-1056	1	Relay, Armature - Start Disconnect				

* - See Separate Group for Components.

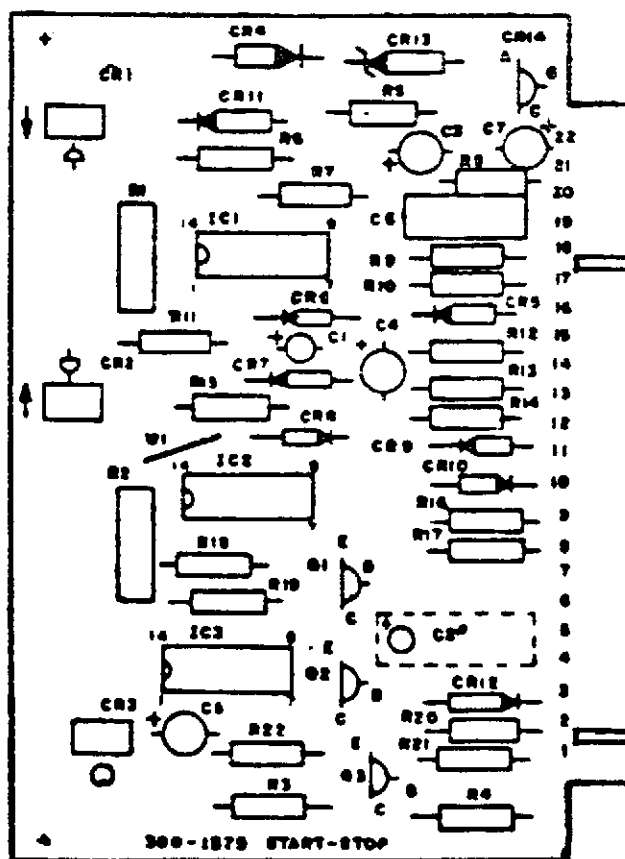
† - Included in Wiring Harness.

CONTROL CHASSIS



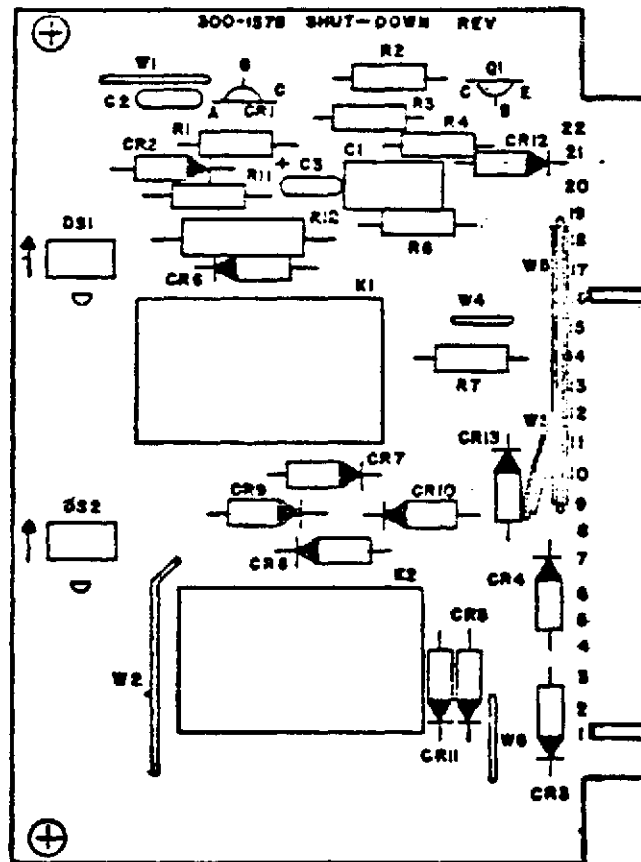
REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
	300-1572	1	Chassis, Control (Complete)
1	332-1884	1	Board, Printed Circuit
2	301-3880	2	Bracket, Module Cover Mtg.
3	332-1917	14	Plug, Keying
4	812-0029	14	Screw, Machine - Roundhead (#4-40 x 3/8" long)
5	332-1887	7	Socket Plug In Module
6	308-0324	2	Switch, Slide
7	812-0059	4	Screw, Machine - Roundhead (#6-32 x 1/4" long)
8	853-0003	4	Washer, Lock - External (#6)
9	526-0047	4	Washer, Flat (.147" ID x 5/16" OD x 1/32" Thk)
10	860-0006	4	Nut, Hex (#6-32)
11	332-1909	1	Block, Terminal (11 Place)
12	323-0983	2	Connector, Receptacle Electrical (12 Pin)
13	356-0068	1	Capacitor, Electrolytic (180 MFD - 40 Volt)

TIME DELAY START-STOP MODULE (300-1579)



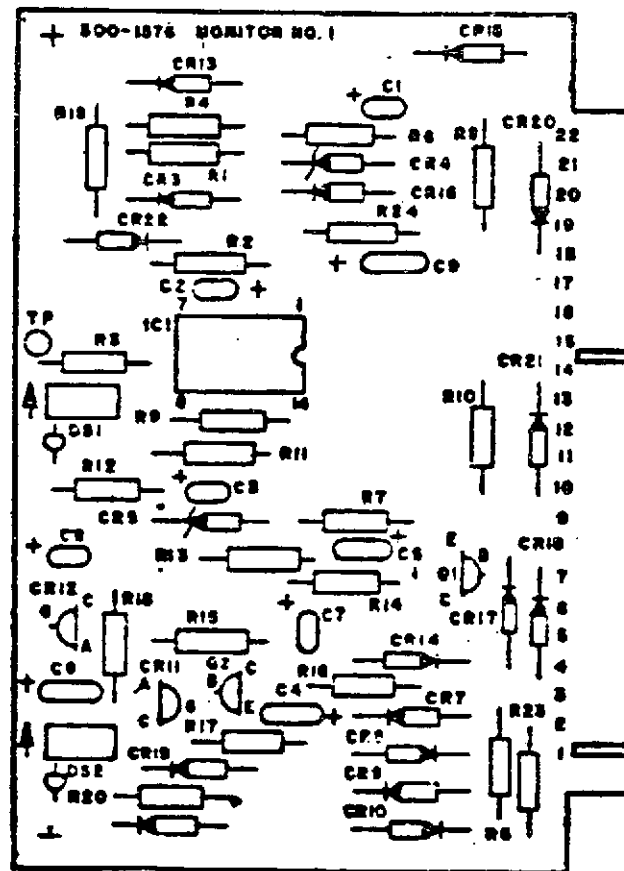
REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION	REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
	300-1579	1	Module, Time Delay Start-Stop (Complete)	1C3	367-0017	1	Integrated Circuit, Counter 7 Stage
C1,2	356-0059	2	Capacitor, Electrolytic (2.2 Mfd., 35 Volt)	Q1,2,3	362-0011	3	Transistor, Signal
C3,4,5	356-0051	3	Capacitor, Electrolytic (6.8 Mfd., 35 Volt)	R1,2	303-0169	2	Potentiometer (3.5 Megohm)
C6	355-0062	1	Capacitor, Composition (1 Mfd., 100 Volt)	R3,19	350-0418	2	Resistor (20,000-Ohm, 2 Watt)
C7	356-0053	1	Capacitor, Tantalum (1.0 Mfd., 35 Volt)	R7	350-0370	1	Resistor (200-Ohm, 1/2 Watt)
CR1	322-0172	1	Lamp, Indicator (Green)	R5,11,15,18	350-0548	4	Resistor (10,000-Ohm, 2 Watt)
CR2	322-0157	1	Lamp, Indicator (Red)	R6	350-0373	1	Resistor (470-Ohm, 1/2 Watt)
CR3	322-0171	1	Lamp, Indicator (Red-Green)	R8	350-0505	1	Resistor (2.7-Ohm, 1/2 Watt)
CR4-12	322-0175	3	Receptacle, Lamp	R10,14,16,22	350-0394	4	Resistor (2,000-Ohm, 1/2 Watt)
	357-0004	9	Rectifier, Diode (400 Volt, 400 MA)	R12	350-0443	1	Resistor (220,000-Ohm, 1/2 Watt)
CR13	359-0002	1	Diode, Zener (13 Volt, 400 MW)	R13,17,20,21	350-0537	4	Resistor (12,000-Ohm, 2 Watt)
CR14	364-0011	1	Rectifier, Gate Control	R4	350-0376	1	Resistor (360-Ohm, 1/2 Watt)
1C1,2	367-0016	2	Integrated Circuit, Timing	R9	350-0524	1	Resistor (100-Ohm, 1/2 Watt)

SHUTDOWN MODULE (300-1578)



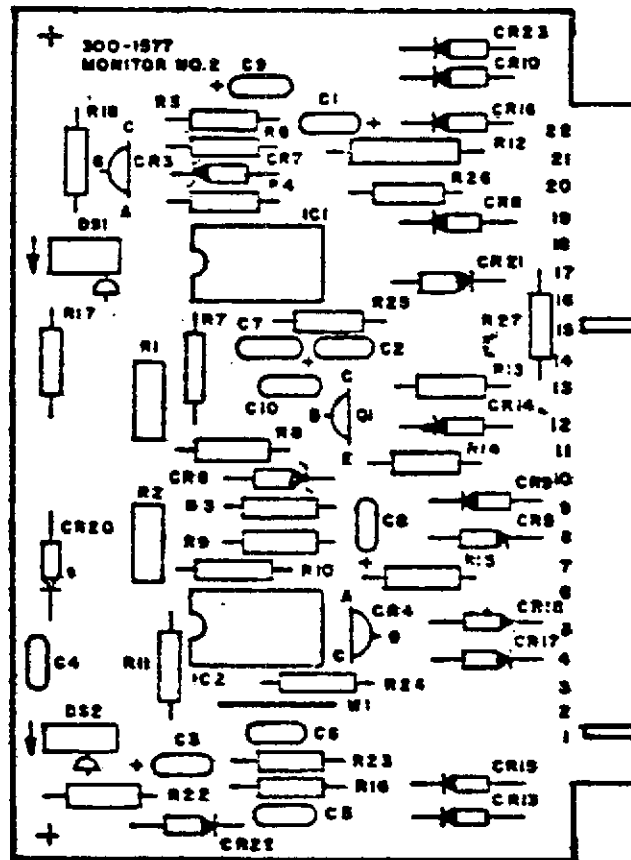
REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
	300-1578	1	Module, Shut Down (Complete)
C1	355-0045	1	Capacitor, Composition (1 Mfd., 200 Volt)
DS1	322-0175	2	Receptacle, Lamp
DS2	322-0172	1	Lamp, Indicator (Red)
C2	355-0041	1	Capacitor, Ceramic (.22 Mfd., 35 Volt)
C3	356-0051	1	Capacitor, Tantalum (6.8 Mfd., 35 Volt)
CR1	364-0011	1	Rectifier, Gate Control
CR2-13	357-0004	12	Rectifier, Diode (400 Volt, 400 MA)
K1,2	307-1076	2	Relay
Q1	362-0026	1	Transistor, Signal
R2	350-0398	1	Resistor (3,000-Ohm, 1/2 Watt)
R1	350-0505	1	Resistor (2.7-Ohm, 1/2 Watt)
R7	350-0533	1	Resistor (560-Ohm, 1/2 Watt)
R3	350-0529	1	Resistor (270-Ohm, 1/2 Watt)
R4	350-0540	1	Resistor (2,200-Ohm, 1/2 Watt)
R6	350-0379	1	Resistor (470-Ohm, 1/2 Watt)
R11,12	350-0393	2	Resistor (1,800-Ohm, 1/2 Watt)

MONITOR NUMBER ONE MODULE (300-1576)



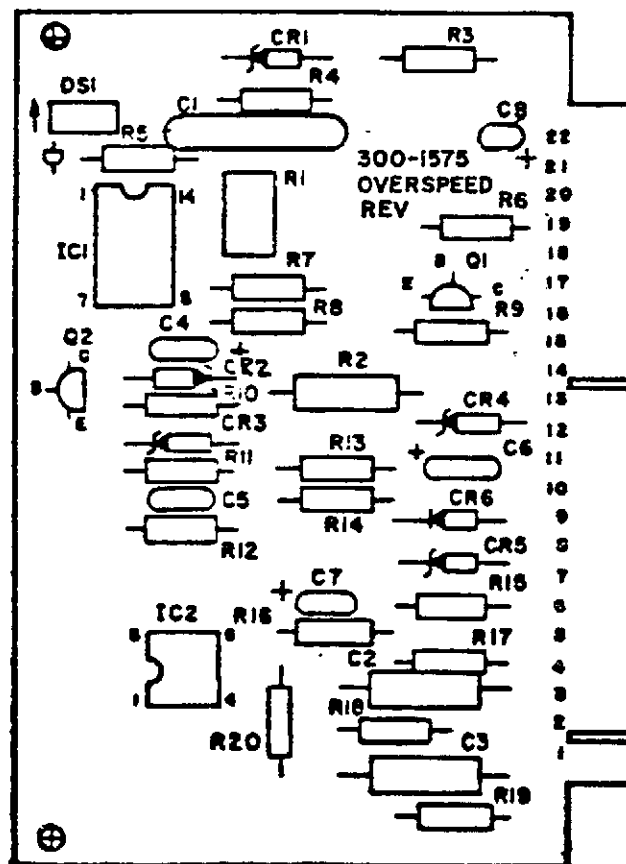
REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION	REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
	300-1576	1	Module, Monitor Number One (Complete)	R1	350-0397	1	Resistor (2,700-Ohm, 1/2 Watt)
C1,2,3, 7,8	356-0051	5	Capacitor, Electrolytic (6.8 Mfd., 35 Volt)	R2	350-0446	1	Resistor (300,000-Ohm, 1/2 Watt)
C4	356-0053	1	Capacitor, Tantalum (1 Mfd., 35 Volt)	R3	350-0584	1	Resistor (10 Megohm, 1/2 Watt)
C5,6,9	355-0041	3	Capacitor, Ceramic (.22 Mfd., 35 Volt)	R4,6	350-0536	2	Resistor (1,000-Ohm, 1/2 Watt)
CR3,7-10, 13-23	357-0004	16	Rectifier, Diode (400 Volt, 400 MA)	R5,23	350-0404	2	Resistor (5,100-Ohm, 1/2 Watt)
CR4	359-0026	1	Diode, Zener (18 Volt, 400 MW)	R7,18	350-0505	2	Resistor (2.7-Ohm, 1/2 Watt)
CR5	359-0002	1	Diode, Zener (13 Volt, 400 MW)	R8	350-0544	1	Resistor (4,700-Ohm, 1/2 Watt)
CR11,12	364-0011	2	Rectifier, Gate Control	R9	350-0548	1	Resistor (10,000-Ohm, 1/2 Watt)
DS1,2	322-0157	2	Lamp, Indicator (Red)	R10,17	350-0529	2	Resistor (270-Ohm, 1/2 Watt)
IC1	367-0016	1	Integrated Circuit, Timing	R11,15	350-0398	2	Resistor (3,000-Ohm, 1/2 Watt)
Q1,2	362-0026	2	Transistor, Signal	R12	350-0380	1	Resistor (510-Ohm, 1/2 Watt)
				R13,14	350-0379	2	Resistor (470-Ohm, 1/2 Watt)
				R16	350-0540	1	Resistor (2,200-Ohm, 1/2 Watt)
				R19,20	350-0393	2	Resistor (18,000-Ohm, 1/2 Watt)
				R24	350-0451	1	Resistor (470,000-Ohm, 1/2 Watt)
					322-0175	2	Receptacle, Lamp

MONITOR NUMBER TWO MODULE (300-1577)



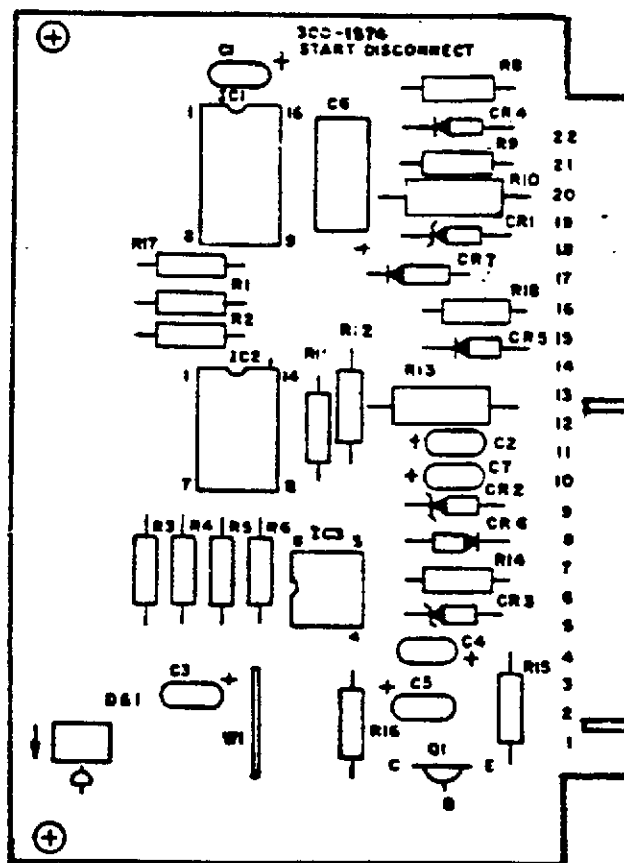
REF. NO.	PART NO.	QTY. used	PART DESCRIPTION
	300-1577	1	Module, Monitor Number Two
C1	356-0066	1	Capacitor, Electrolytic (47 Mfd.)
C2	356-0059	1	Capacitor, Electrolytic (2.2 Mfd., 35 Volt)
C3,8,9	356-0051	3	Capacitor, Electrolytic (6.8 Mfd., 35 Volt)
C4,5,6,7,10	355-0041	5	Capacitor, Ceramic (.22 Mfd.)
CR3,4	364-0011	2	Rectifier, Gate Control
CR5-9,13-18,20-23	357-0004	14	Rectifier, Diode (400 Volt, 400 MA)
CR6	359-0016	1	Diode, Zener (6.8 Volt, 400 MW)
CR7	359-0033	1	Diode, Zener (14 Volt, 5 W)
IC1,2	367-0016	2	Integrated Circuit, Timing
DS1,2	322-0157	2	Lamp, Indicator (Red)
	322-0175	2	Receptacle, Lamp
Q1	362-0011	1	Transistor, Signal
R1,2	303-0169	2	Potentiometer (3.5 Megohm)
R3	350-0420	1	Resistor (24,000-Ohm, 1/2 Watt)
R4,7,10,13,16	350-0548	5	Resistor (10,000-Ohm, 1/2 Watt)
R5,15	350-0379	2	Resistor (470-Ohm, 1/2 Watt)
R6,9	350-0398	2	Resistor (3,000-Ohm, 1/2 Watt)
R8	350-0418	1	Resistor (20,000-Ohm, 1/2 Watt)
R11	350-0466	1	Resistor (2 Megohm, 1/2 Watt)
R12	350-0672	1	Resistor (240-Ohm, 1/2 Watt)
R14	350-0389	1	Resistor (1,200-Ohm, 1/2 Watt)
R17,18	350-0393	2	Resistor (1,800-Ohm, 1/2 Watt)
R22,23	350-0505	2	Resistor (2,700-Ohm, 1/2 Watt)
R24,25,27	350-0451	3	Resistor (470,000-Ohm, 1/2 Watt)
R26	350-0421	1	Resistor (27,000-Ohm, 1/2 Watt)

OVERSPEED MODULE (300-1575)



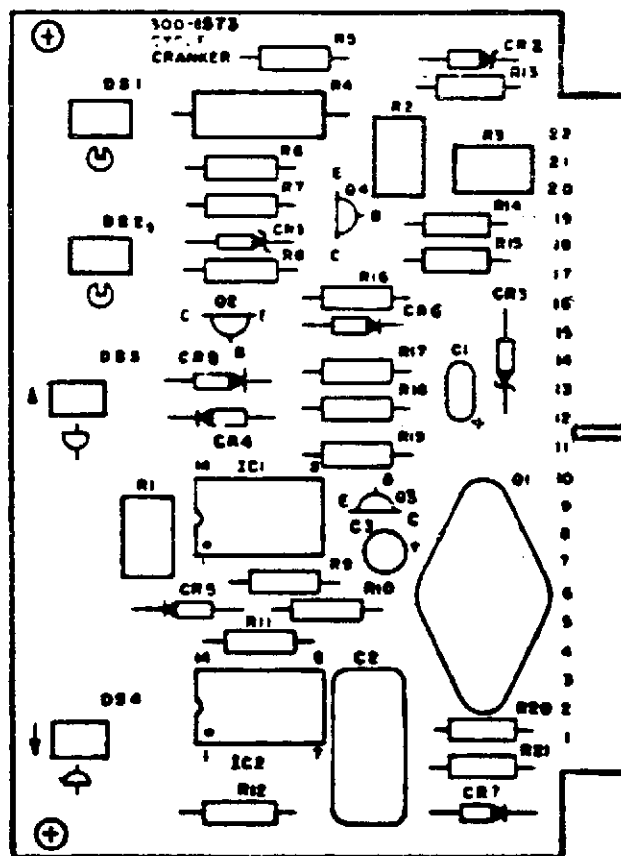
REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION	REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
	300-1575	1	Module, Overspeed (Complete)	CR6	357-0004	1	Rectifier, Diode (400 Volt, 400 MA)
C1	355-0043	1	Capacitor, Composition (22 Mfd., 200 Volt)	DS1	322-0172	1	Lamp, Indicator (Green)
C2,3	355-0010	2	Capacitor, Composition (.0022 Mfd., 100 Volt)		322-0175	1	Receptacle, Lamp
C4,8	356-0051	2	Capacitor, Electrolytic (6.8 Mfd., 35 Volt)	IC1	367-0002	1	Integrated Circuit
C5	355-0049	1	Capacitor, Ceramic (22 Mfd., 1000 Volt)	IC2	367-0001	1	Integrated Circuit
C6,7	356-0066	2	Capacitor, Tantalum (47 Mfd., 20 Volt)	Q1,2	362-0011	2	Transistor, Signal
CR1,3	359-0016	2	Diode, Zener (6.8 Volt, 400,000 Watt)	R1	303-0191	1	Potentiometer (5,000-Ohm, 4 Watt)
CR2	359-0017	1	Diode, Zener (5.1 Volt, 400 MW)	R2	350-0683	1	Resistor (680-Ohm, 1 Watt)
CR4	359-0032	1	Diode, Zener (8.2 Volt, 400 MW)	R3	350-0379	1	Resistor (470-Ohm, 2 Watt)
CR5	359-0002	1	Diode, Zener (13 Volt, 400 MW)	R4,6,7	350-0411	7	Resistor (10,000-Ohm, 1/2 Watt)
				8,10,17,19			
				R5	350-0414	1	Resistor (13,000-Ohm, 1/2 Watt)
				R9	350-0427	1	Resistor (47,000-Ohm, 1/2 Watt)
				R11,13	350-0394	2	Resistor (2,000-Ohm, 1/2 Watt)
				R14	350-0380	1	Resistor (510-Ohm, 1/2 Watt)
				R15,18	350-0536	2	Resistor (1,000-Ohm, 2 Watt)
				R12,16,20	350-0451	3	Resistor (470,000-Ohm, 1/2 Watt)

START DISCONNECT MODULE (300-1574)



REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
	300-1574	1	Module, Start Disconnect (Complete)
C1,2,3	356-0051	3	Capacitor, Electrolytic (6.8 Mfd., 35 Volt)
C4,7	356-0066	2	Capacitor, Tantalum (.47 Mfd.)
C5	356-0059	1	Capacitor, Electrolytic (2.2 Mfd)
C6	355-0045	1	Capacitor, Composition (.1 Mfd)
DS1	322-0172	1	Lamp, Indicator
CR1,2	359-0033	2	Diode, Zener (14 Volt, 5 Watt)
CR3	359-0032	1	Diode, Zener (8.2 Volt)
CR4,5,6,7	357-0004	4	Rectifier, Diode (400 Volt, 400 Milliampere)
1C1	367-0014	1	Integrated Circuit (Multivibrator)
1C2	367-0013	1	Integrated Circuit (Dual, 2 Input, and Gate)
1C3	367-0001	1	Integrated Circuit (Oral Amp)
Q1	362-0011	1	Transistor, Signal
R1,2,5,6	350-0418	1	Resistor (20,000-Ohm, 1/2 Watt)
R3,11,12,15,16	350-0548	5	Resistor (10,000-Ohm, 1/2 Watt)
R4,8	350-0422	2	Resistor (30,000-Ohm, 1/2 Watt)
R9	350-0435	1	Resistor (100,000-Ohm, 1/2 Watt)
R10,13	350-0672	2	Resistor (240-Ohm, 1 Watt)
R14	350-0404	1	Resistor (1,000-Ohm, 1/2 Watt)
R18	350-0536	1	Resistor (1,000-Ohm, 1/2 Watt)
R17	350-0459	1	Resistor (1 Megohm, 1/2 Watt)
	322-0175	1	Receptacle, Lamp

CYCLE CRANKER MODULE (300-1573)



REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION	REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
	300-1573	1	Module, Cycle Cranker (Complete)	R1	303-0171	1	Potentiometer (100,000-Ohm)
C1	356-0066	1	Capacitor, Tantalum (47 Mfd., 20 Volt)	R2,3	303-0191	2	Potentiometer (5000-Ohm)
C2	355-0042	1	Capacitor (.47 Mfd., 250 Volt)	R4	350-1132	1	Resistor (470-Ohm, 2 Watt)
DS1,2	322-0171	2	Lamp, Indicator (Red-Green)	R5,18	350-0532	2	Resistor (470-Ohm, 1/2 Watt)
DS3	322-0157	1	Lamp, Indicator, (Red)	R6,8	350-0537	2	Resistor (1200-Ohm, 1/2 Watt)
DS4	322-0172	1	Lamp, Indicator (Green)	R7	350-0382	1	Resistor (620-Ohm, 1/2 Watt)
CR1	359-0032	1	Diode, Zener - 8.2 Volt	R9	350-0394	1	Resistor (2000-Ohm, 1/2 Watt)
CR2	359-0016	1	Diode, Zener - 6.8 Volt	R10	350-0418	1	Resistor (20,000-Ohm, 1/2 Watt)
CR3	359-0002	1	Diode, Zener - 13 Volt	R11,13,16	350-0548	5	Resistor (10,000-Ohm, 1/2 Watt)
CR4-8	357-0004	5	Rectifier, Diode - 400 Volt 400 MA	R12	350-0437	1	Resistor (120,000-Ohm, 1/2 Watt)
IC1	367-0017	1	Integrated Circuit, Counter	R14,15	350-0538	2	Resistor (1,000-Ohm, 1/2 Watt)
IC2	367-0016	1	Integrated Circuit, Timing	R19	350-0380	1	Resistor (510-Ohm, 1/2 Watt)
Q1	362-0038	1	Transistor, Power	R20	350-0387	1	Resistor (1,000-Ohm, 1/2 Watt)
Q2,3,4	362-0011	3	Transistor, Signal	C3	356-0051	1	Capacitor, Electrolytic (6.8 Mfd., 35 Volt)
					322-0175	4	Receptacle, Lamp

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Introduction

This Parts Manual applies to the Standard Sets Listed below. The illustrations are arranged in groups of related items, and each part or assembly is identified by a Reference Number. All parts illustrated are typical, and unless otherwise mentioned in the description column the parts are interchangeable between models.

These typical illustrations are subject to change and reflect only the latest replacement parts arrangement. The Right and Left sides of the Set are determined by FACING the FRONT of the Set (Engine End)

Set Data Table

MODEL IDENTIFICATION	RATING	RPM RATING	BATTERY VOLTAGE
165.0 DFP - */# @	165,000 WATTS	1500 RPM	24 VDC
190.0 DFP - */# @	190,000 WATTS	1500 RPM	24 VDC
200.0 DFP - */# @	200,000 WATTS	1800 RPM	24 VDC
230.0 DFP - */# @	230,000 WATTS	1800 RPM	24 VDC

Electrical Data Table

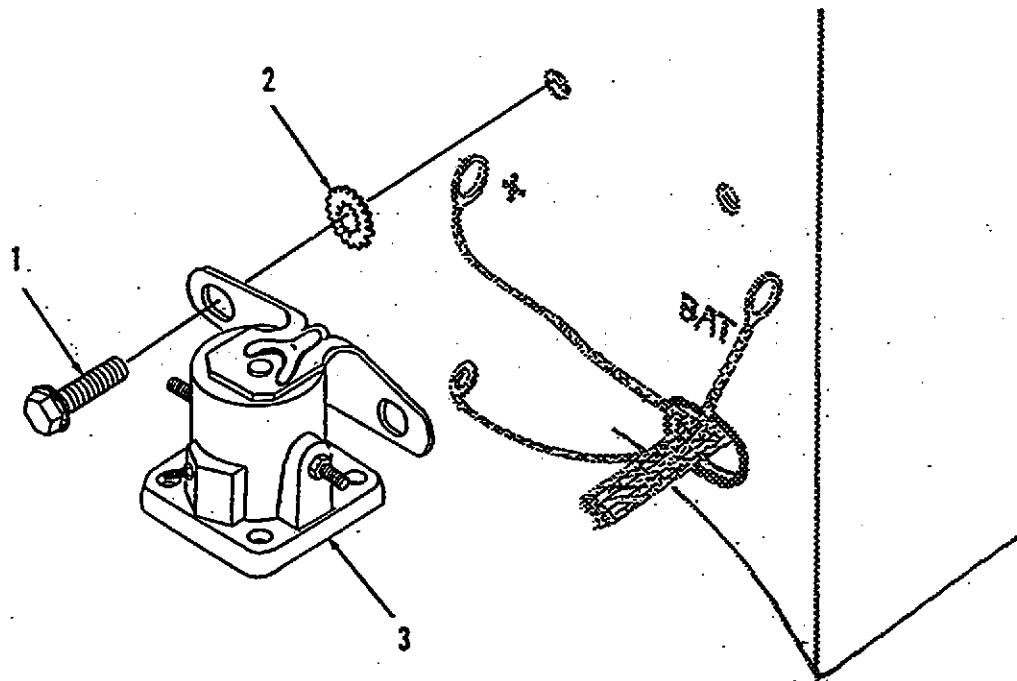
*VOLTAGE CODE	VOLTS	HERTZ	WIRE	PHASE	NOTES
5D	120/240	60	4	3	
6D	240/480	60	4	3	
7	220/380	60	4	3	
9X	347/600	60	4	3	
17	120/208	60	12	3	+
	127/220	60	12	3	
	139/240	60	12	3	
	240/416	60	12	3	
	254/440	60	12	3	
	277/480	60	12	3	
517	110/190	50	12	3	+
	115/200	50	12	3	
	120/208	50	12	3	
	127/220	50	12	3	
	220/380	50	12	3	
	230/400	50	12	3	
	240/416	50	12	3	
	254/440	50	12	3	
17R50	Same as 17	60	12	3	&

- * - Voltage Codes follow Model Letter designations.
- # - Specification Number: Number 1 is Standard, all others indicate variations.
- @ - Specification Letter: Letter advances (A to B, B to C, etc) with major manufacturing changes.
- + - The Stators are Reconnectible.
- & - Penn State Sets Only, Special Parts identified in manual when used.

Engine Replacement Parts

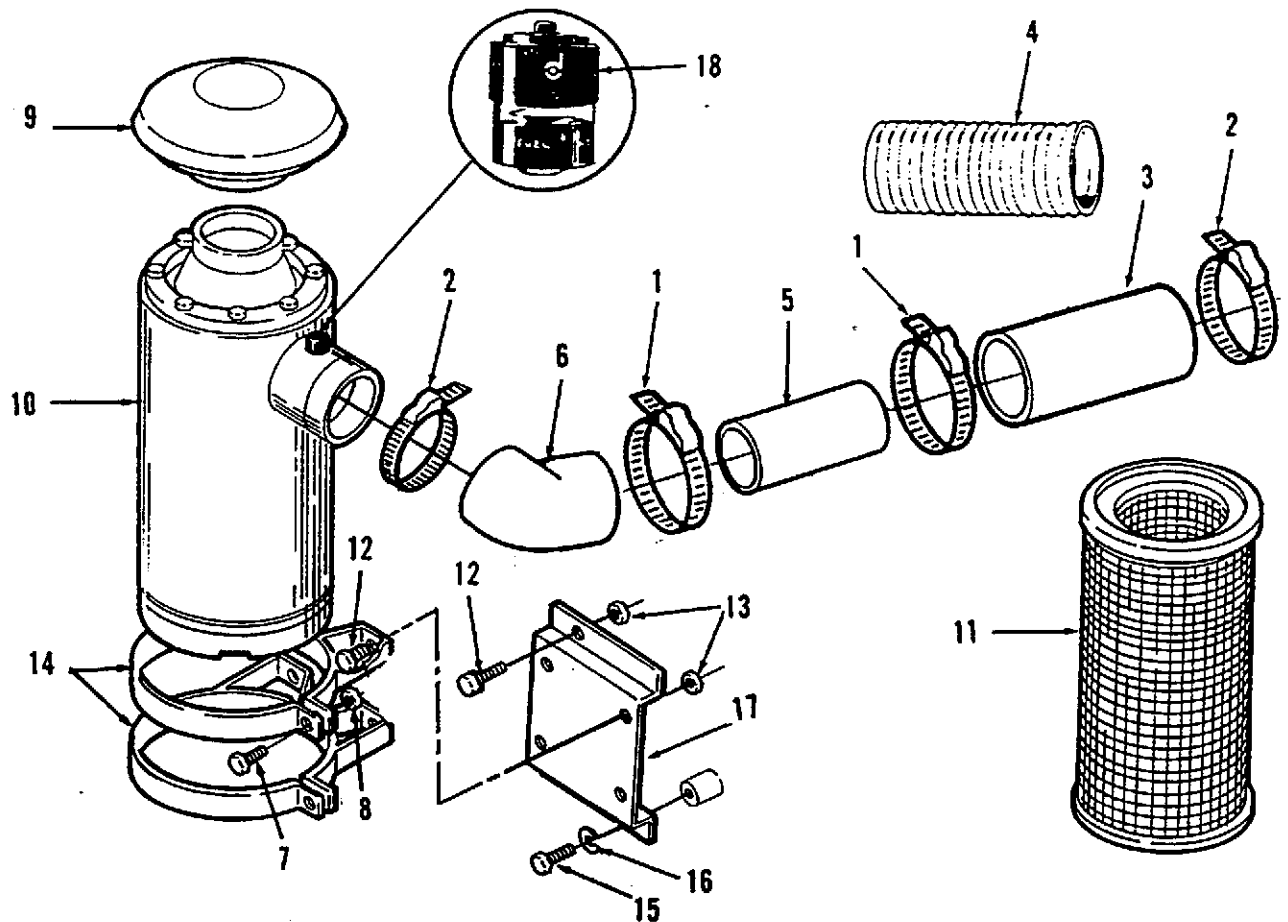
All Engine replacement parts must be ordered from the Engine Manufacturer, except those modified or added by Onan. When ordering engine parts, refer to the Engine Manufacturer's Nameplate and supply the Model, Specification, Serial Numbers and other available information. Refer to the Engine Manufacturer's Manuals for your nearest authorized Parts Distributor; or contact the Onan Distributor from whom you purchased this set, for assistance in ordering the replacement parts.

Start Solenoid
Begin Spec M



REF NO.	PART NO.	QTY USED	PART DESCRIPTION	REF NO.	PART NO.	QTY USED	PART DESCRIPTION
1	821-0010	2	Screw, Self-locking - Hex Head (1/4-20 x 1/2")	2	856-0006	2	Washer, Lock - EIT (1/4")
				3	307-2167	1	Solenoid, Start (K2)

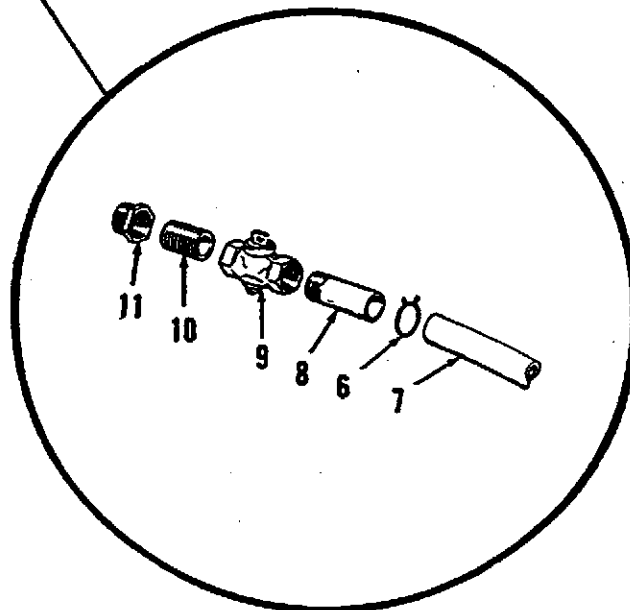
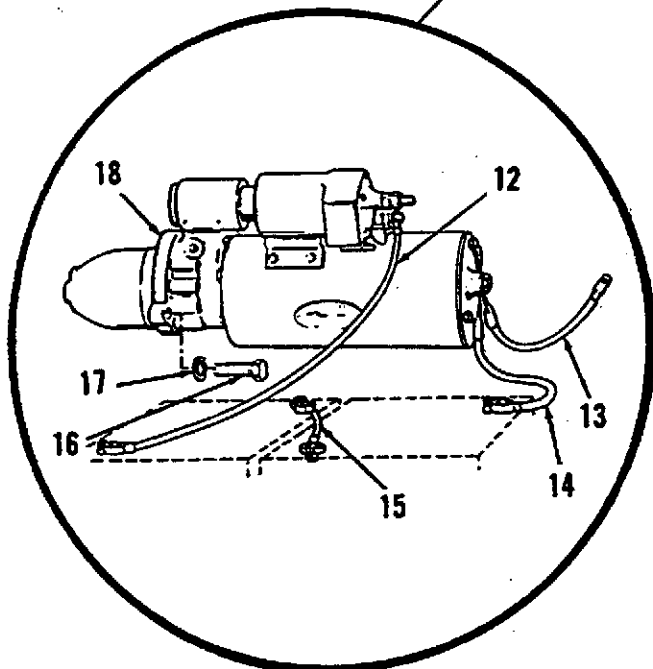
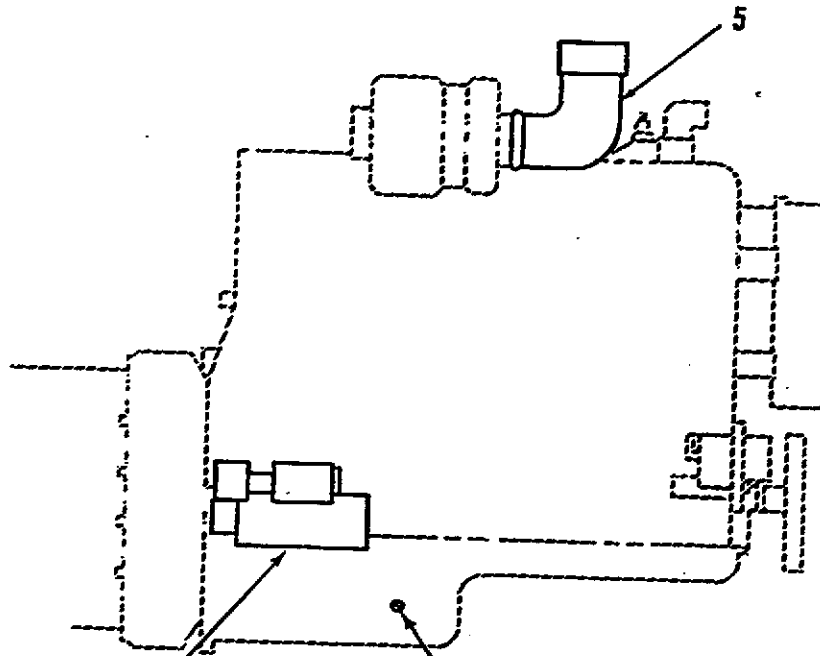
Air Cleaner



M1290

REF NO.	PART NO.	QTY USED	PART DESCRIPTION	REF NO.	PART NO.	QTY USED	PART DESCRIPTION
1	503-0863	2	Clamp, Hose - Begin July 1981	10	140-1346	1	Air Cleaner (Includes Element)
2	503-0863	2	Clamp, Hose	11	140-1376	1	Element
3	503-0806	1	Hose - Begin July 1981	12	821-0029	5	Screw, Self-locking - Hex (3/8-16 x 3/4")
4	503-0855	1	Hose - 1970 Thru June 1981	13	870-0281	5	Nut, Self-locking - Hex (5/16-18 x 1-3/4")
5	140-1795	1	Tube - Begin July 1981	14	140-1345	2	Band, Mounting
6	503-1092	1	Elbow, Hose - Begin July 1981	15	801-0119	2	Screw, Cap - Hex Head (5/16-18 x 1")
7	800-0032	2	Screw, Cap - Hex Head (5/16-18 x 1-3/4")	16	850-0070	2	Washer, Lock - Spring (5/8")
8	870-0257	2	Nut, Self-locking - Hex (5/16-18)	17	140-1349	1	Bracket, Mounting
9	140-1347	1	Cap, Air Cleaner	18	140-1548	1	Indicator, Service

Miscellaneous Engine Parts Left Side

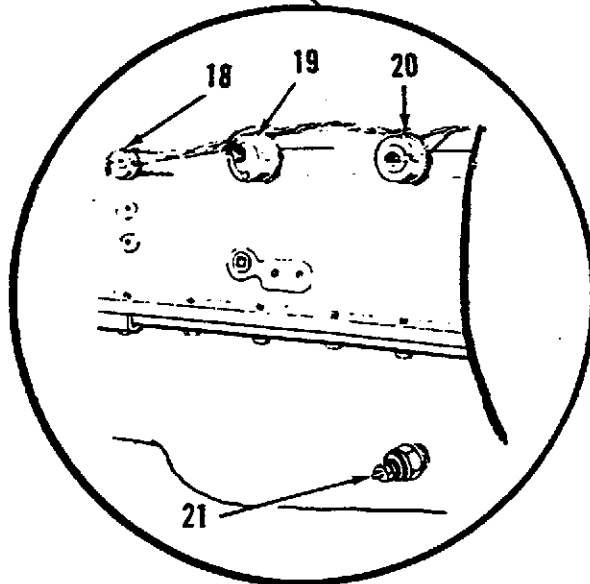
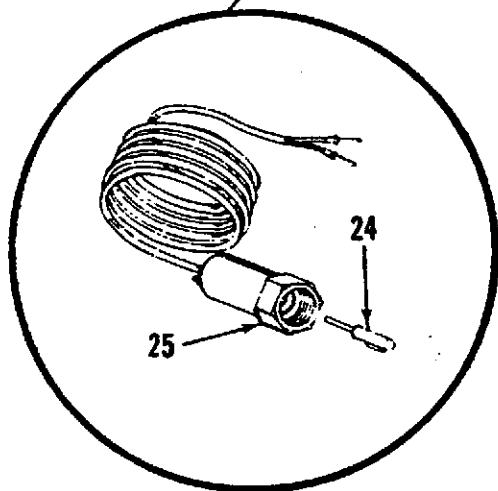
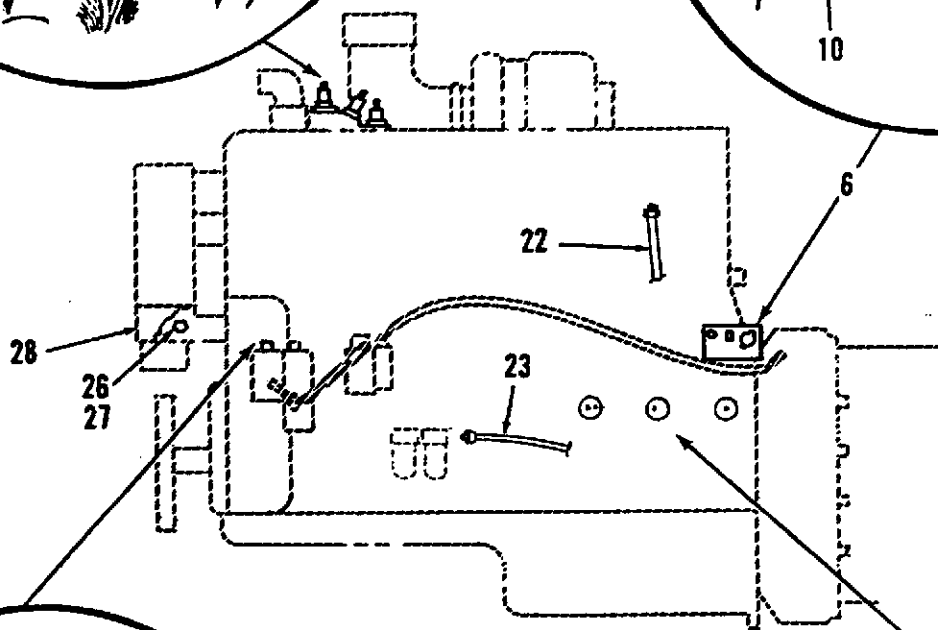
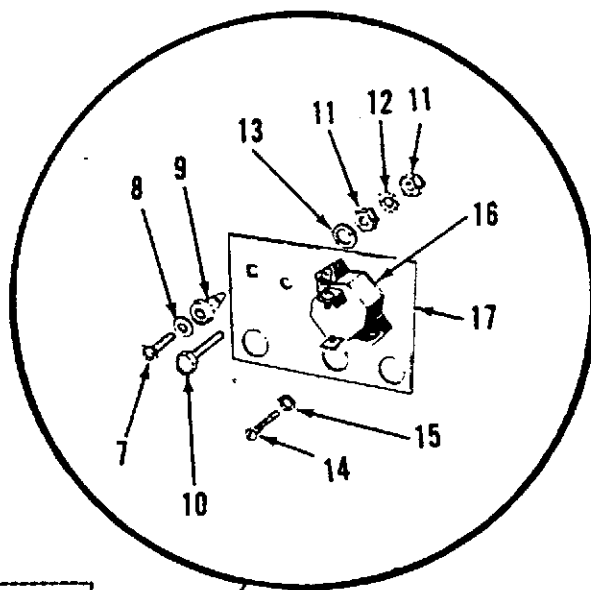
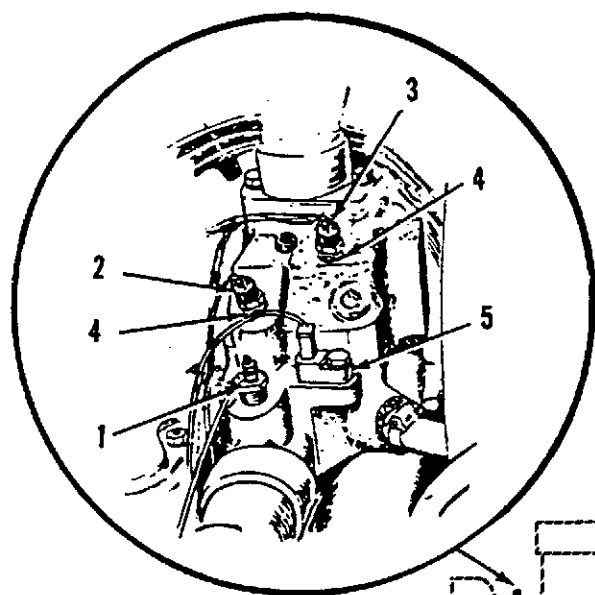


M1239

Miscellaneous Engine Parts Left Side

REF NO.	PART NO.	QTY USED	PART DESCRIPTION	REF NO.	PART NO.	QTY USED	PART DESCRIPTION
1	338-2067	1	Harness, Wiring - Begin Spec M (Includes Connectors)	9	504-0011	1	Valve
2	323-1304	1	Housing, Connector - 6 Place	10	505-0100	1	Nipple, Pipe - Close
	323-1200	6	Contact, Pin	11	505-0022	1	Bushing, Reducer - Hex
3	323-1306	1	Housing, Connector - 8 Place	12	416-0636	1	Cable, Battery - Positive
	323-1200	8	Contact, Pin	13	416-0632	1	Cable, Electrical - Ground
4	338-0957	1	Harness, Wiring - Spec H Thru L	14	416-0639	1	Cable, Battery - Negative
5	155-1035	1	Elbow, Exhaust	15	416-0473	1	Cable, Electrical - Jumper
6	503-0197	1	Clamp, Loop	16	800-0135	3	Screw, Cap - Hex Head (5/16-11 x 2-1/4")
7	503-0888	1	Hose	17	850-0070	3	Washer, Lock - Spring (5/8")
8	505-0185	1	Nipple, Pipe - Half	18	191-1348	1	Starter

Miscellaneous Engine Parts Right Side



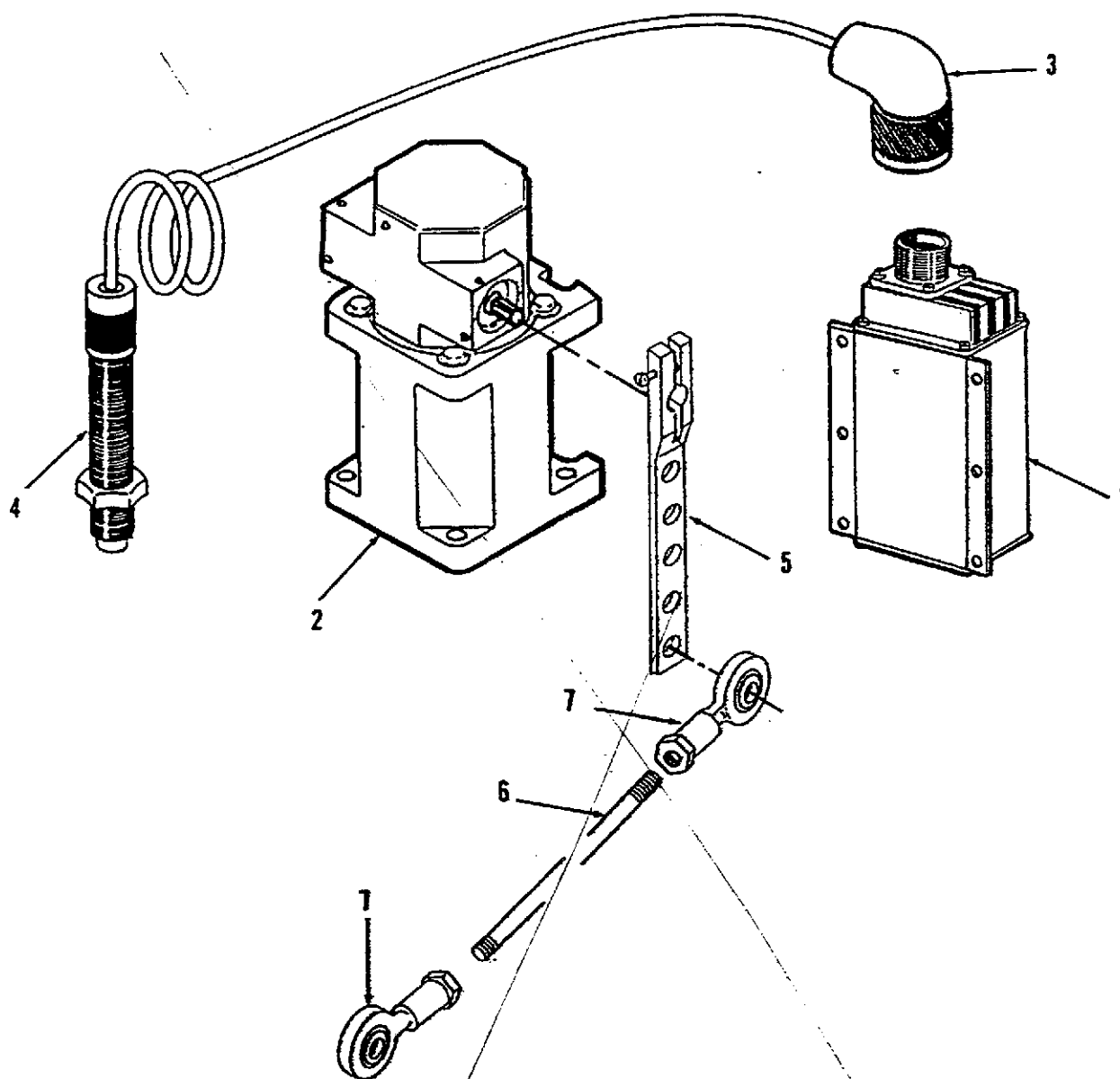
M1240

Miscellaneous Engine Parts Right Side

REF NO.	PART NO.	QTY USED	PART DESCRIPTION	REF NO.	PART NO.	QTY USED	PART DESCRIPTION
1			Sender, Temperature - Engine Coolant (E2)	14	813-0103	2	*Screw, Machine - Round Head (#10-32 x 3/4")
	193-0247	1	Begin Spec K	15	850-0030	2	*Washer, Lock - Spring (#10)
	193-0109	1	Spec H - J	16	320-0240	1	*Breaker, Circuit
2	309-0178	1	Switch, Thermostatic - Coolant Temperature (S2)	17	332-1382	1	*Board, Terminal
3	309-0179	1	Switch, Thermostatic - Coolant Temperature - Shutdown (S6)	18	309-0272	1	Switch, Pressure - Oil - Alarm (S5)
4	505-0117	1	Bushing, Reducer - Flush	19			Sender, Pressure - Oil (E1)
5	309-0269	1	Switch, Temperature - Low Engine Temperature (S4)		193-0244	1	Begin Spec K
6	332-1383	1	Terminal Assembly (Includes Parts Marked*)		193-0108	1	Spec H - J
7	809-0035	1	*Screw, Tapping - Round Head (#8 x 3/4")	20	309-0169	1	Switch, Pressure - Oil - Shutdown (S1)
8	508-0015	1	*Washer, Insulating	21			Sender, Temperature - Oil (E5)
9	870-0196	1	*Nut, Insulated		193-0249	1	Begin Spec K
10	800-0005	1	*Screw, Cap - Hex Head (1/4-20 x 3/4")		193-0109	1	Spec H - J
11	862-0001	2	*Nut, Hex (1/4-20)	22	501-0216	1	Line, Fuel - Return
12	856-0006	1	*Washer, Lock - EIT (1/4")	23	501-0084	1	Line, Fuel - Incoming
13	850-0040	1	*Washer, Lock - Spring (1/4")	24	302-0753	1	Tang, Drive - Tachometer
				25	302-0750	1	Sender - Tachometer
				26	800-0130	1	Screw, Cap - Hex Head (5/8-11 x 1")
				27	850-0070	1	Washer, Lock - Spring (5/8")
				28	191-1144	1	Guard, Belt

*- Parts included in Circuit Breaker Assembly.

Electronic Governor

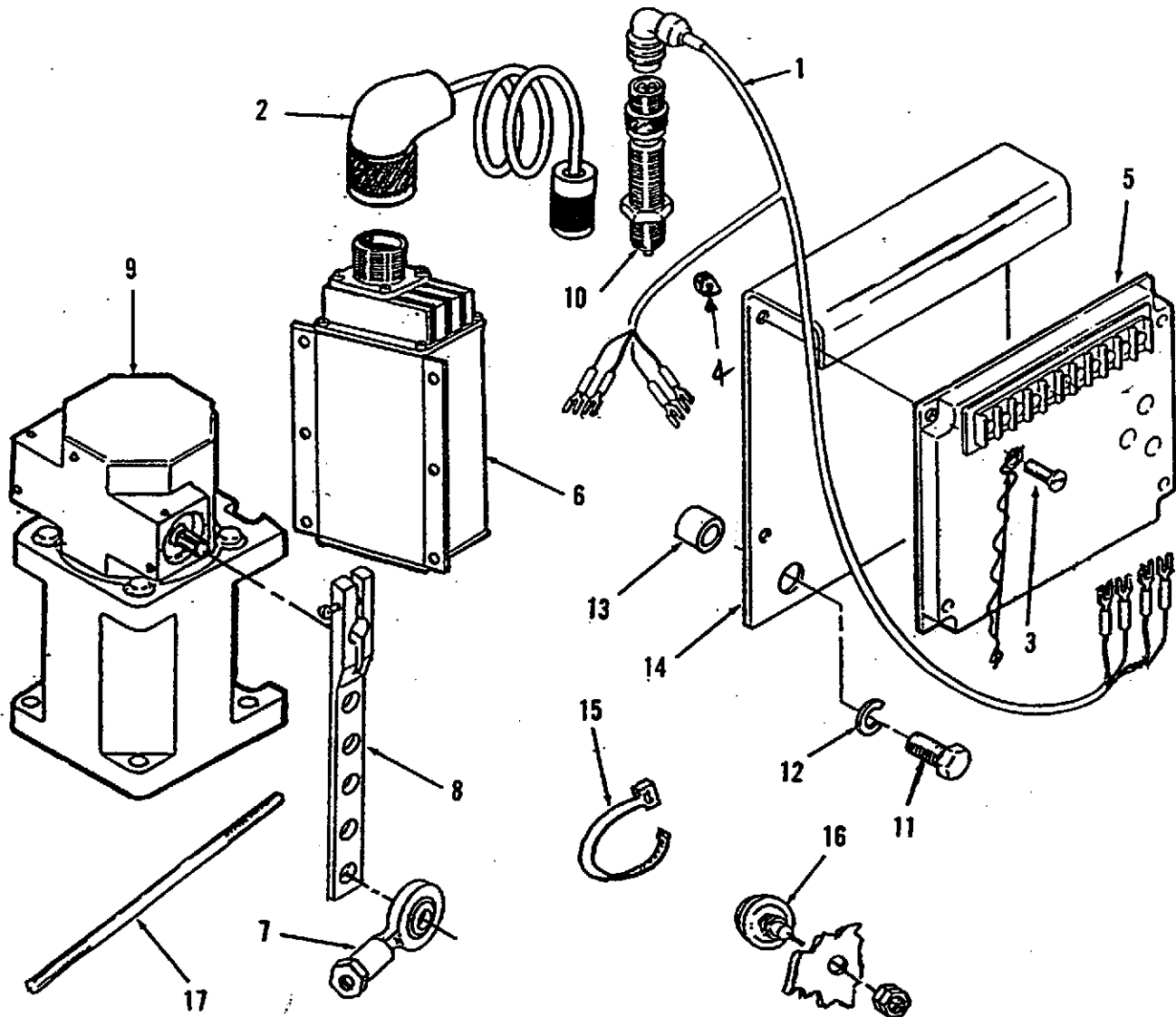


FS1272-1

REF NO.	PART NO.	QTY USED	PART DESCRIPTION
1	151-0399	1	Controller
2	151-0419	1	Actuator
3	338-0989	1	Harness, Wiring

REF NO.	PART NO.	QTY USED	PART DESCRIPTION
4	151-0411	1	Pickup, Magnetic
5	151-0441	1	Lever
6	151-0442	1	Rod, Threaded
7	151-0443	2	Joint, Ball

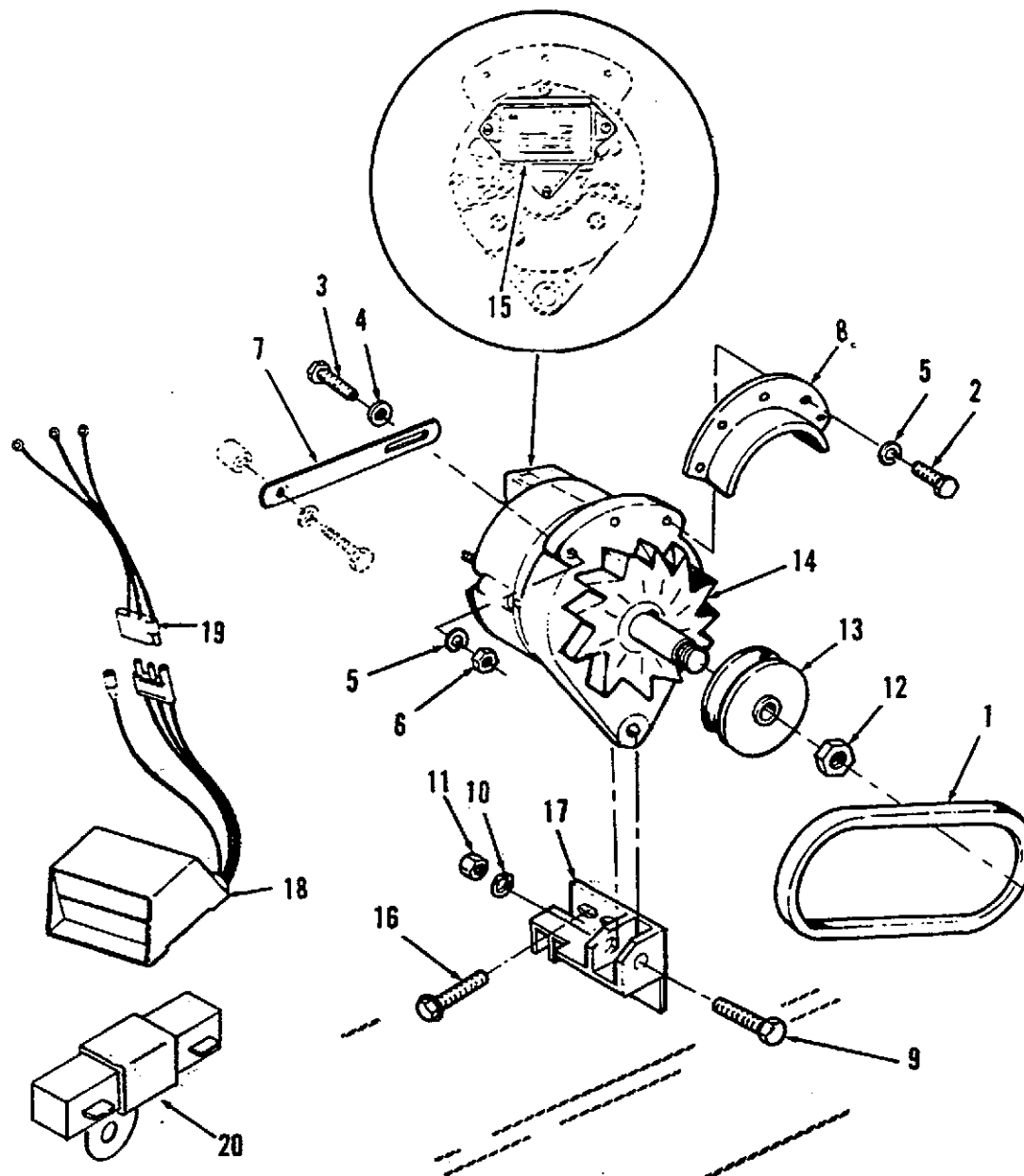
Electric Governor



REF NO.	PART NO.	QTY USED	PART DESCRIPTION
1	338-1777	1	Harness, Wiring - Begin Spec M
2	338-1086	1	Harness, Wiring - Spec H Thru L
3	813-0103	4	Screw, Machine - Round Head (#10-32 x 3/4")
4	870-0131	4	Nut, Self-locking, Hex (#10-32)
5	151-0637	1	Controller, Governor - Begin Spec M
6	151-0399	1	Controller, Governor - Spec H Thru L
7	151-0443	2	Joint, Ball - Spec H Thru L

REF NO.	PART NO.	QTY USED	PART DESCRIPTION
8	151-0441	1	Lever - Spec H Thru L
9	151-0419	1	Actuator - Spec H Thru L
10	151-0411	1	Pickup, Magnetic
11	800-0151	2	Screw, Cap - Hex Head (3/4-10 x 1")
12	850-0079	2	Washer, Lock - Spring (3/4")
13	370-4040	2	Spacer, Sleeve
14	150-2007	1	Bracket, Mounting - Begin Spec M
15	332-1445	9	Tie, Cable
16	151-0402	1	Potentiometer - Speed Control - Spec H Thru L (Mounted in Set Control)
17	151-0442	1	Rod, Threaded - Spec H Thru L

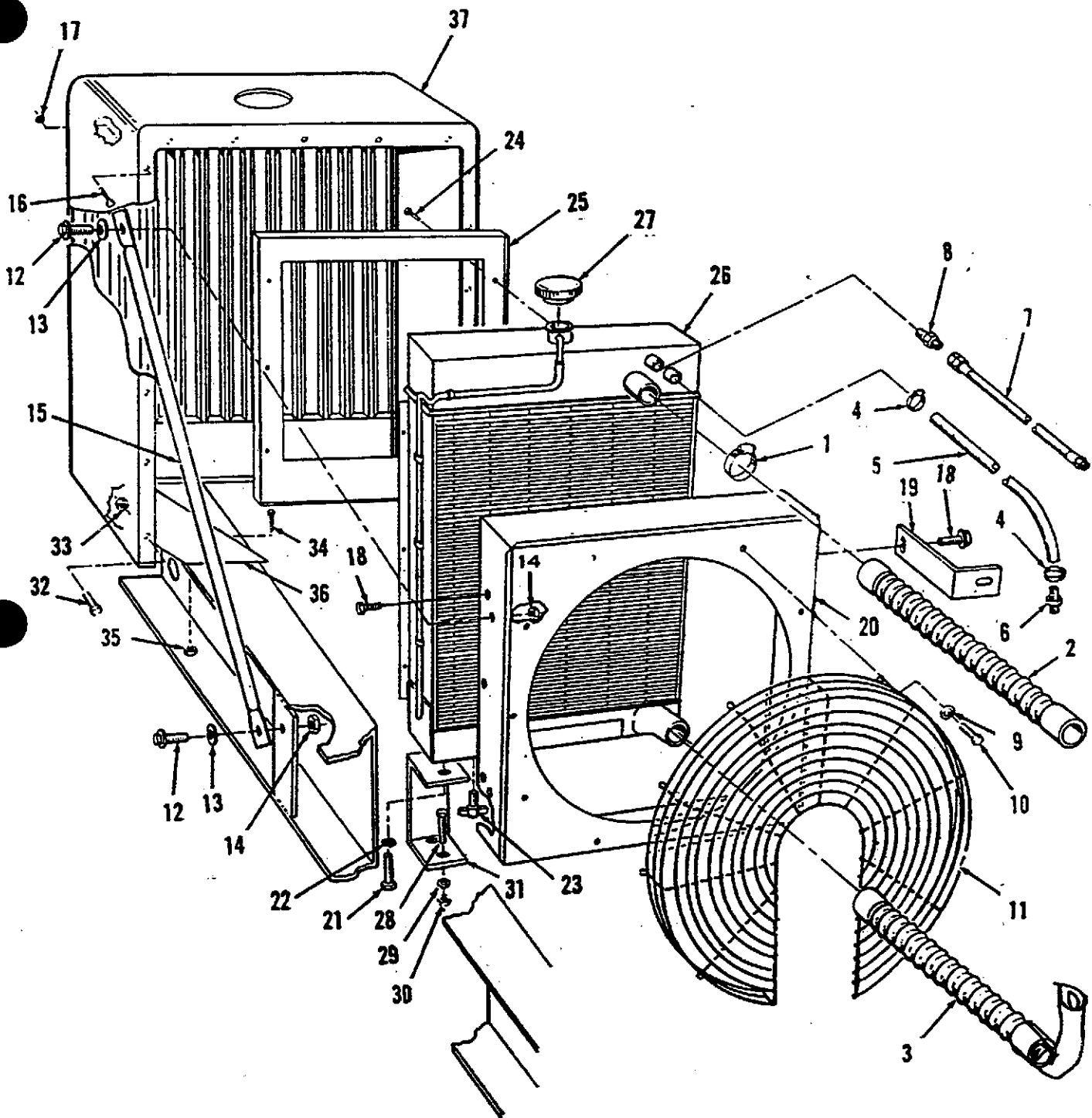
Alternator



ES1138

REF NO.	PART NO.	QTY USED	PART DESCRIPTION	REF NO.	PART NO.	QTY USED	PART DESCRIPTION
1	511-0084	1	Belt	13	191-0781	1	Pulley
2	821-0014	1	Screw, Self-locking - Hex (5/16-18 x 1/2")	14	191-0688	1	Alternator-Standard
3	800-0030	1	Screw, Cap - Hex Head (5/16-18 x 1-1/4")		191-1258	1	Marine
4	526-0030	1	Washer, Flat (5/16")	15	191-0733	1	Regulator, Voltage (Used with Standard Alternator)
5	850-0045	2	Washer, Lock - Spring (5/16")	16	821-0029	2	Screw, Self-locking - Hex (3/8-16 x 3/4")
6	862-0015	1	Nut, Hex (5/16-18)	17	191-1141	1	Bracket, Mounting
7	191-0869	1	Strap, Adjusting	18	191-0548	1	Regulator, Voltage (Used with Marine Alternator)
8	191-0725	1	Guard, Belt	19	191-0681	1	Cable, Electrical (Used with Marine Alternator)
9	800-0095	1	Screw, Cap - Hex Head (1/2-13 x 2-1/4")	20	191-0550	1	Resistor (Used with Marine Alternator)
10	850-0060	1	Washer, Lock - Spring (1/2")				
11	862-0016	1	Nut, Hex (1/2-13)				
12	868-0007	1	Nut, Hex (5/8-18)				

Cooling System Radiator



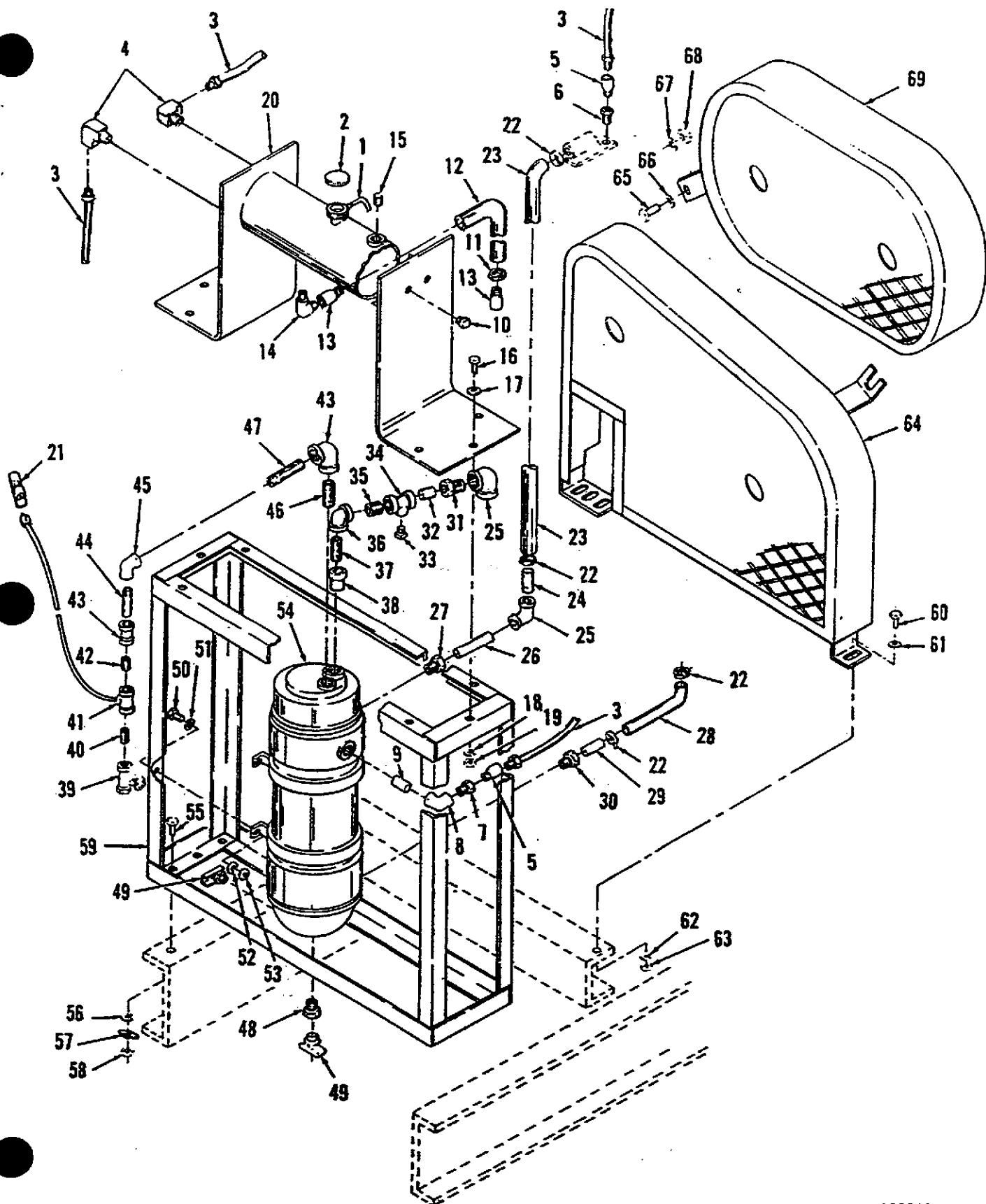
XCS1132

Cooling System Radiator

REF NO.	PART NO.	QTY USED	PART DESCRIPTION	REF NO.	PART NO.	QTY USED	PART DESCRIPTION
1	503-0354	4	Clamp, Hose	20			Shroud, Fan
2	503-0752	1	Hose, Upper		130-1017	1	Opening for 34" Fan
3	503-0858	1	Hose, Lower- <i>Reinforced</i>		130-0846	1	Opening for 32" Fan
4	503-0429	2	Clamp, Hose	21	800-0130	4	Screw, Cap - Hex Head (5/8-11 x 1")
5	503-0877	1	Hose	22	850-0070	4	Washer, Lock - Spring (5/8")
6	505-0759	1	Adapter, Pipe to Hose	23	504-0028	1	Cock, Drain
7	501-0087	1	Line, Fuel	24	821-0014	16	Screw, Self-locking - HEX (5/16-18 x 1/2")
8	502-0184	1	Connector, Pipe	25	130-0842	1	Shroud, Radiator
9	821-0018	8	Screw, Self-locking - Hex (1/4-20 x 5/8")	26	130-0992	1	Radiator (Include Cap)
10	526-0018	8	Washer, Flat (1/4")	27	130-0449	1	Cap, Radiator
11	130-0924	1	Guard, Fan	28	800-0092	4	Screw, Cap - Hex Head (1/2-13 x 1-1/2")
12	821-0029	4	Screw, Self-locking - Hex (3/8-16 x 3/4")	29	850-0060	4	Washer, Lock - Spring (1/2")
13	526-0077	4	Washer, Flat (3/8")	30	862-0016	4	Nut, Hex (1/2-13)
14	870-0281	4	Nut, Self-locking - Hex (3/8-16)	31	130-1412	2	Bracket, Support
15	405-1888	2	Brace	32	821-0016	4	Screw, Self-locking - Hex (5/16-18 x 3/4")
16	821-0016	4	Screw, Self-locking - Hex (5/16-18 x 3/4")	33	870-0257	4	Nut, Self-locking - Hex (5/16-18)
17	870-0257	4	Nut, Self-locking - Hex (5/16-18)	34	800-0030	4	Screw, Cap - Hex Head (5/16-18 x 1-1/4")
18	821-0016	6	Screw, Self-locking - Hex (5/16-18 x 3/4")	35	870-0048	4	Nut, Self-locking - Hex (5/16-18)
19	130-0848	2	Brace	36	405-2016	2	Bracket, Mounting
				37	405-1884	1	Panel, Housing - Front

fan from Cummins

Cooling System Heat Exchanger

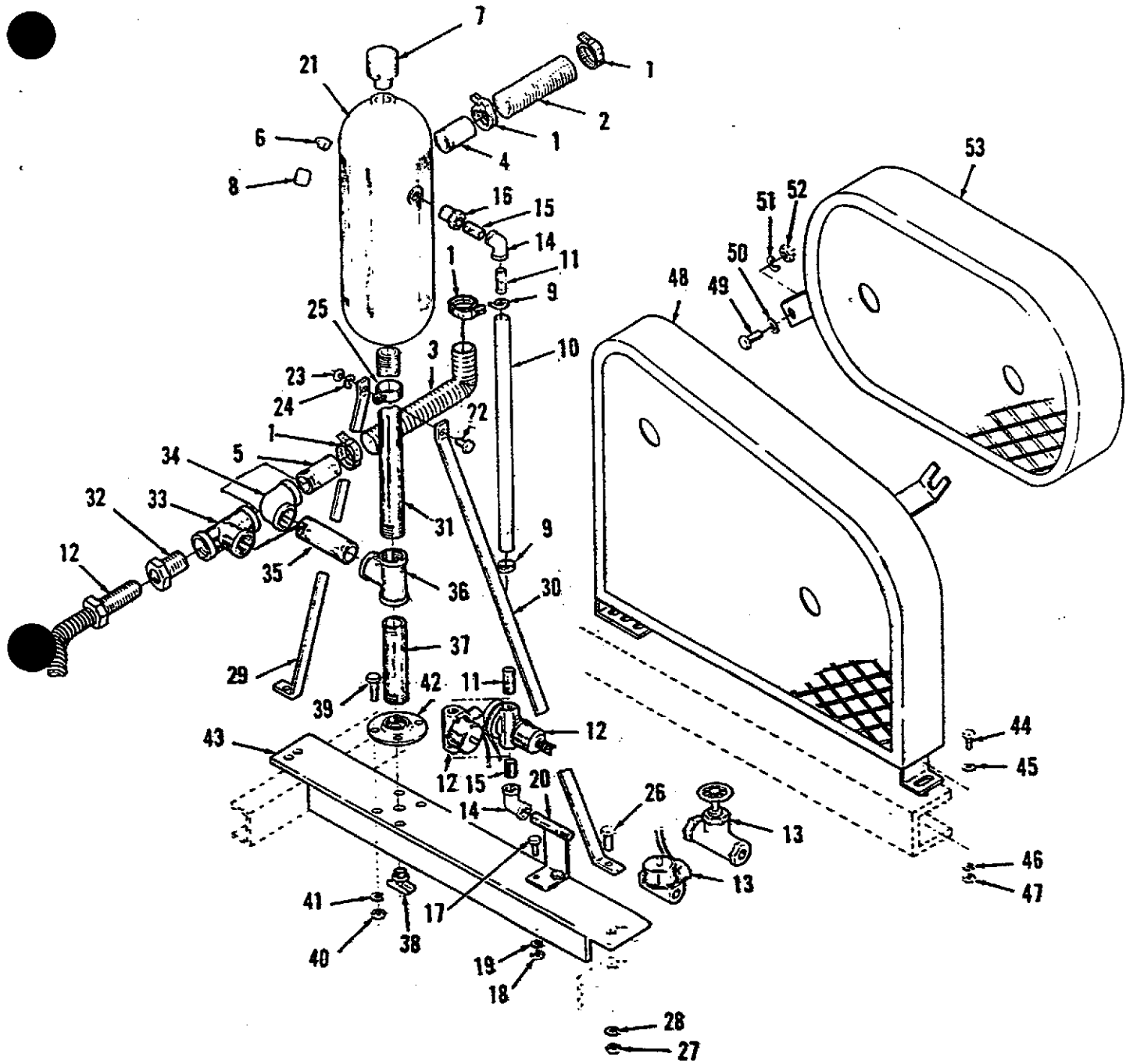


CS1149

Cooling System Heat Exchanger

REF NO.	PART NO.	QTY USED	PART DESCRIPTION	REF NO.	PART NO.	QTY USED	PART DESCRIPTION
1	503-0539	1	Hose	37		1	Nipple, Pipe
2	130-0449	1	Cap, Radiator		505-0220	1	1-1/2"
3	501-0087	2	Line, Fuel		505-0172	1	2"
4	502-0020	2	Elbow, Pipe - Street, 90 Degree	38	505-0187	1	Bushing, Reducer
5	502-0184	2	Adapter, Pipe to Hose	39	504-0057	1	Valve, Globe
6	502-0143	1	Bushing, Reducer	40	505-0172	1	Nipple, Pipe
7	502-0049	1	Bushing, Reducer	41	307-0844	1	Valve, Solenoid
8	505-0039	1	Elbow, Pipe - 90 Degree	42	505-0172	1	Nipple, Pipe
9	505-0101	1	Nipple, Pipe - Close	43	505-0175	1	Elbow, Pipe - 90 Degree
10	505-0057	2	Plug, Pipe - Square Head	44	505-0405	1	Nipple, Pipe
11	503-0429	2	Clamp, Hose	45	505-0872	1	Elbow, Pipe - 45 Degree
12	503-0799	1	Hose	46	505-0172	1	Nipple, Pipe
13	505-0759	2	Adapter, Pipe to Hose	47	505-0173	1	Nipple, Pipe
14	505-0003	1	Elbow, Pipe - Street, 90 Degree	48	502-0019	1	Bushing, Reducer
15	505-0054	1	Plug, Pipe	49	504-0028	2	Cock, Drain
16	800-0051	6	Screw, Cap - Hex Head (3/8-16 x 1-1/4")	50	800-0051	4	Screw, cap - Hex Head (3/8-16 x 1-1/4")
17	526-0013	6	Washer, Flat (3/8")	51	526-0013	4	Washer, Flat (3/8")
18	850-0050	6	Washer, Lock - Spring (3/8")	52	850-0050	4	Washer, Lock - Spring (3/8")
19	862-0003	6	Nut, Hex (3/8-16)	53	862-0003	4	Nut, Hex (3/8-16)
20	130-1887	1	Tank, Expansion	54	130-1431	1	Exchanger, Heat
21	332-1506	1	Splice	55	800-0094	5	Screw, Cap - Hex Head (1/2-13 x 2")
22	503-0354	8	Clamp, Hose				
23	503-0752	1	Hose	56	850-0060	5	Washer, Lock - Spring (1/2")
24	505-0375	1	Nipple, Pipe - Half	57	526-0278	5	Washer, Bevel - Square
25	505-0175	2	Elbow, Pipe - 90 Degree	58	862-0005	5	Nut, Hex (1/2-13)
26	505-0172	1	Nipple, Pipe	59	130-1833	1	Frame, Support
27	505-0738	1	Bushing, Reducer	60	800-0028	4	Screw, Cap - Hex Head (5/16-18 x 1")
28	503-0858	1	Hose - Preformed				
29	505-0380	1	Nipple, Pipe	61	526-0041	4	Washer, Flat (5/16")
30	505-0738	1	Bushing, Reducer	62	850-0045	4	Washer, Lock - Spring (5/16")
31	505-0187	1	Bushing, Reducer	63	862-0014	4	Nut, Hex (5/16-18)
32	505-0220	1	Nipple, Pipe - Close	64	130-1891	1	Guard, Belt
33	505-0402	1	Plug, Pipe	65	800-0088	1	Screw, Cap - Hex Head (1/2-13 x 3/4")
34	505-1072	1	Valve, Water Saver				
35			Nipple, Pipe	66	526-0061	1	Washer, Flat (1/2")
	505-0220	1	1-3/4"	67	850-0060	1	Washer, Lock - Spring (1/2")
	505-0748	1	9"	68	862-0005	1	Nut, Hex (1/2-13)
36			Elbow, Pipe - 90 Degree	69	130-1136	1	Guard, Belt
	505-0043	1	1-1/2"				
	505-0175	1	2"				

Cooling System Standpipe

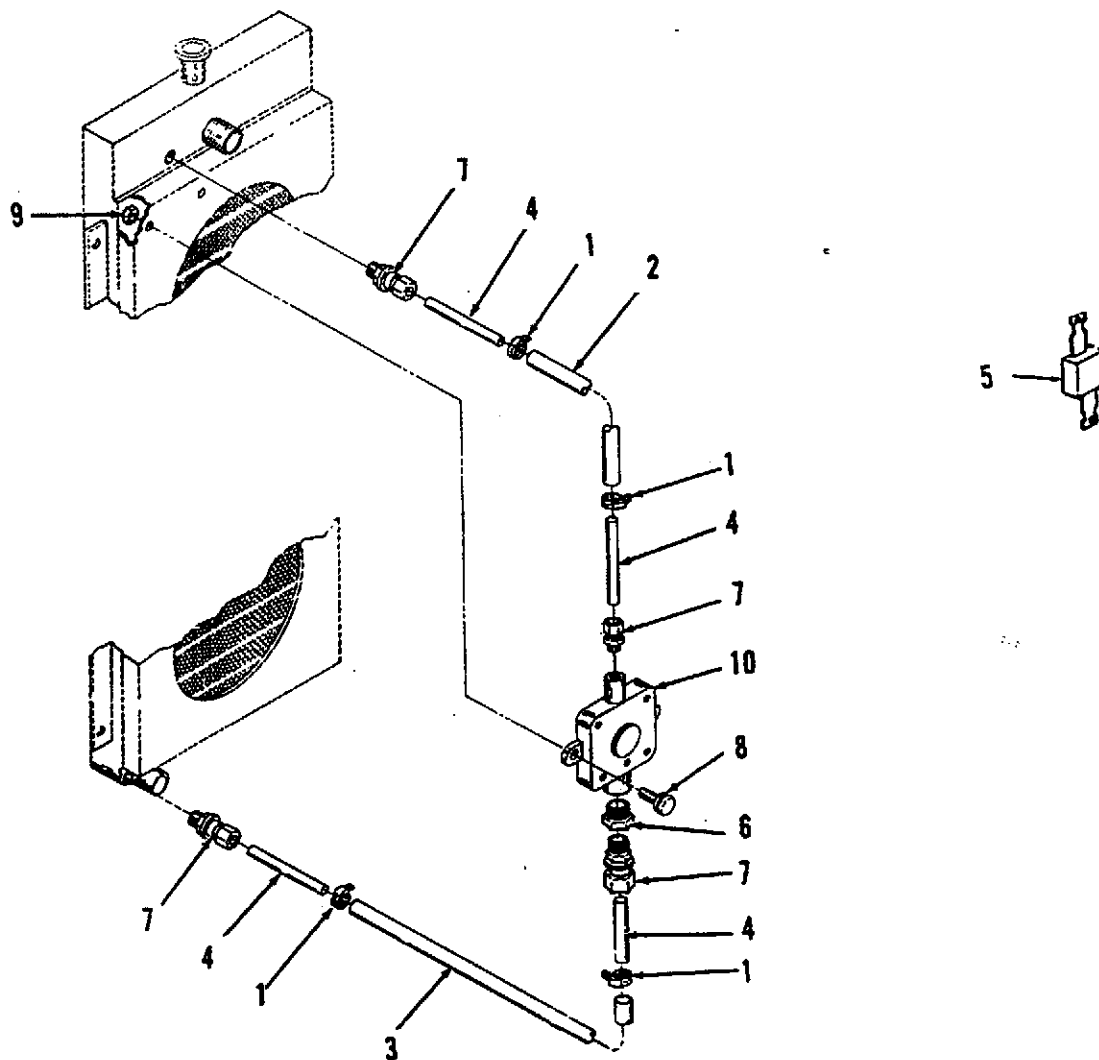


XCS1134

Cooling System Standpipe

REF NO.	PART NO.	QTY USED	PART DESCRIPTION	REF NO.	PART NO.	QTY USED	PART DESCRIPTION
1	503-0354	4	Clamp, Hose	27	862-0005	2	Nut, Hex (1/2-13)
2	503-0617	1	Hose	28	850-0060	2	Washer, Lock - Spring (1/2")
3	503-0756	1	Hose, Preformed	29	130-1178	1	Brace
4	505-0204	1	Nipple, Pipe - Half	30	130-1179	1	Brace
5	505-0875	1	Adapter, Pipe to Hose	31	505-0746	1	Nipple, Pipe
6	505-0140	1	Plug, Pipe - Square Head	32	505-0351	1	Bushing, Reducer
7	504-0062	1	Valve, Vacuum Relief	33	505-0374	1	Tee, Pipe
8	505-0949	1	Plug, Pipe - Socket Head	34	505-0175	1	Elbow, Pipe - 90 Degree
9	503-0189	2	Clamp, Hose	35	505-0748	1	Nipple, Pipe
10	503-0361	1	Hose	36	505-0374	1	Tee, Pipe
11	505-0330	2	Nipple, Pipe - Half	37	505-0379	1	Nipple, Pipe
12			Valve, Control	38	504-0006	1	Cock, Drain
	309-0242	1	Temperature Regulating	39	800-0092	6	Screw, Cap - Hex Head (1/2-13 x 1-1/2")
	307-1135	1	Solenoid				
13			Valve, Control	40	862-0005	6	Nut, Hex (1/2-13)
	307-1135	1	Solenoid	41	850-0060	6	Washer, Lock - Spring (1/2")
	504-0090	1	Manual	42	130-0442	1	Base
14	505-0041	2	Elbow, Pipe - 90 Degree	43	130-1177	1	Support
15	505-0004	2	Nipple, Pipe - Close	44	800-0028	4	Screw, Cap - Hex Head (5/16-18 x 1")
16	505-0023	1	Bushing, Reducer	45	526-0041	4	Washer, Flat (5/16")
17	800-0007	2	Screw, cap - Hex Head (1/4-20 x 1")	46	850-0045	4	Washer, Lock - Spring (5/16")
18	862-0001	2	Nut, Hex (1/4-20)	47	862-0014	4	Nut, Hex (5/16-18)
19	850-0040	2	Washer, Lock - Spring (1/4")	48	130-1132	1	Guard, Belt
20	130-0797	1	Nipple, Support	49	800-0088	1	Screw, Cap - Hex Head (1/2-13 x 3/4")
21	130-0425	1	Tank, Standpipe				
22	800-0051	1	Screw, Cap - Hex Head (3/8-16 x 1-1/4")	50	526-0060	1	Washer, Flat (1/2")
23	862-0003	1	Nut, Hex (3/8-16)	51	850-0060	1	Washer, Lock - Spring (1/2")
24	850-0050	1	Washer, Lock - Spring (3/8")	52	862-0005	1	Nut, Hex (1/2-13)
25	130-0871	1	Clamp, Loop	53	130-1136	1	Guard, Belt
26	800-0092	2	Screw, Cap - Hex Head (1/2-13 x 1-1/2")				

Coolant Level Switch

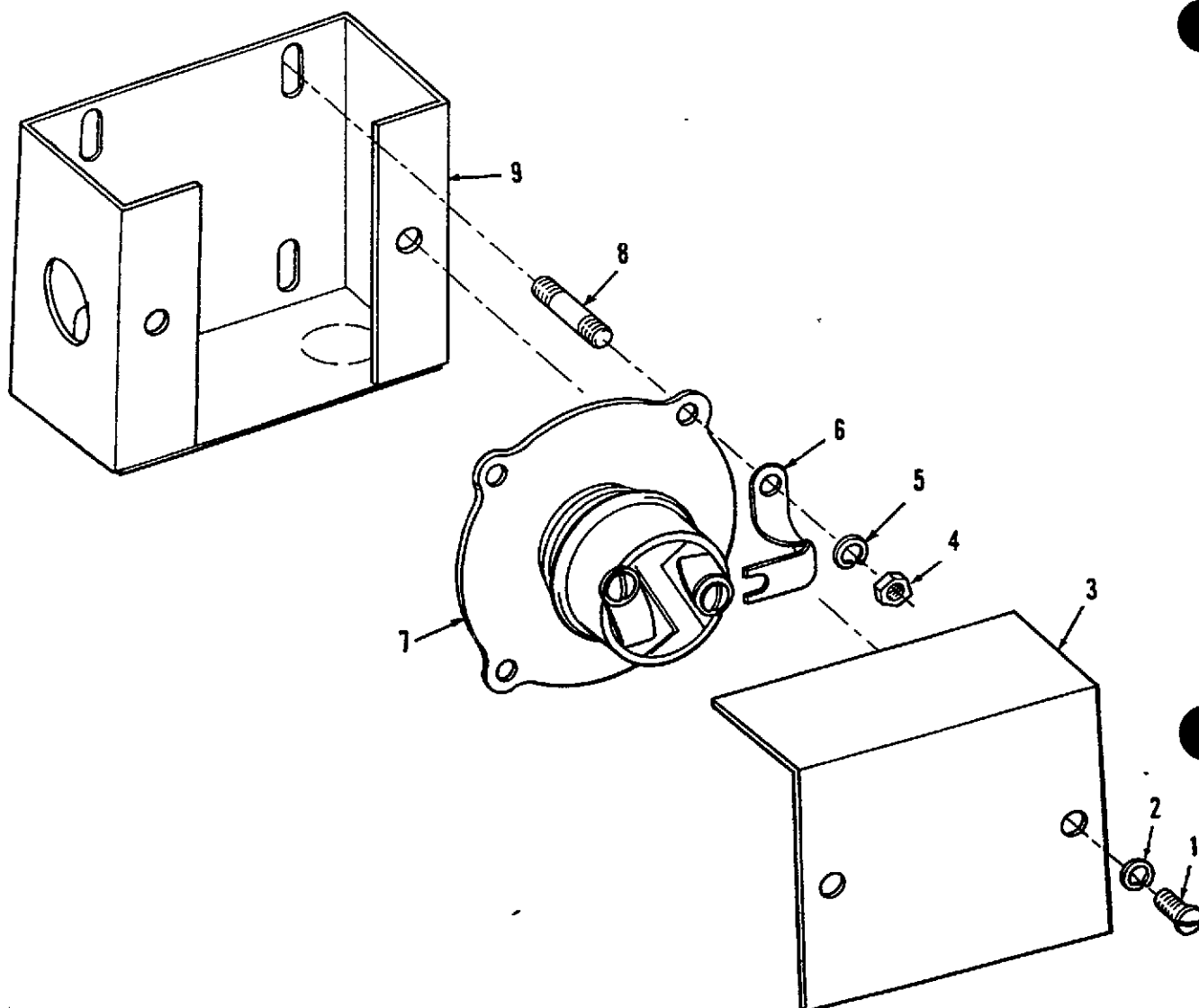


CS1148.

REF NO.	PART NO.	QTY USED	PART DESCRIPTION
1	503-0685	4	Clamp, Hose
2	503-1199	1	Hose
3	503-1119	1	Hose
4	130-2053	4	Tube
5	357-0030	2	Diode
6	502-0802	1	Bushing, Reducer - Hex

REF NO.	PART NO.	QTY USED	PART DESCRIPTION
7	502-0801	4	Connector, Tube, Brass
8	821-0011	2	Screw, Self-locking - Hex (1/4-20 x 7/8")
9	870-0212	2	Nut, Self-locking - Hex (1/4-20)
10	193-0329	1	Switch, Level - Coolant

Engine Temperature Switch

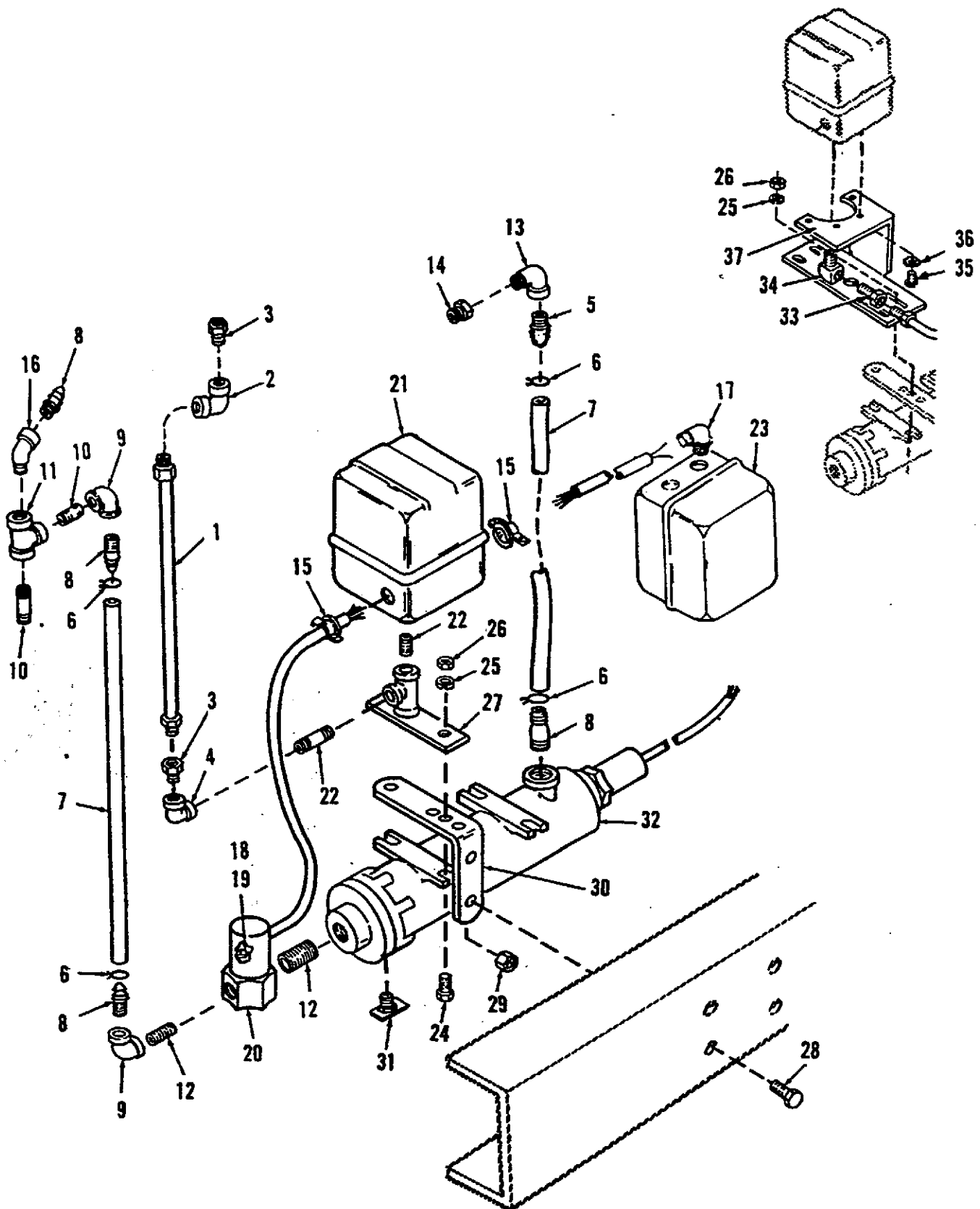


CS1063

REF NO.	PART NO.	QTY USED	PART DESCRIPTION
1	812-0075	2	Screw, Machine - Round Head (#8-32 x 1/4")
2	850-0025	2	Washer, Lock - Spring (#8)
3	333-0013	1	Cover
4	870-0053	2	Nut, Hex (#10-32)

REF NO.	PART NO.	QTY USED	PART DESCRIPTION
5	850-0030	2	Washer, Lock - Spring (#10)
6	160-0428	1	Strap, Ground
7	309-0029	1	Switch, Thermostatic
8	520-0446	2	Stud (#10-32 x 3/4")
9	333-0012	1	Box

Heater Horizontal Tank

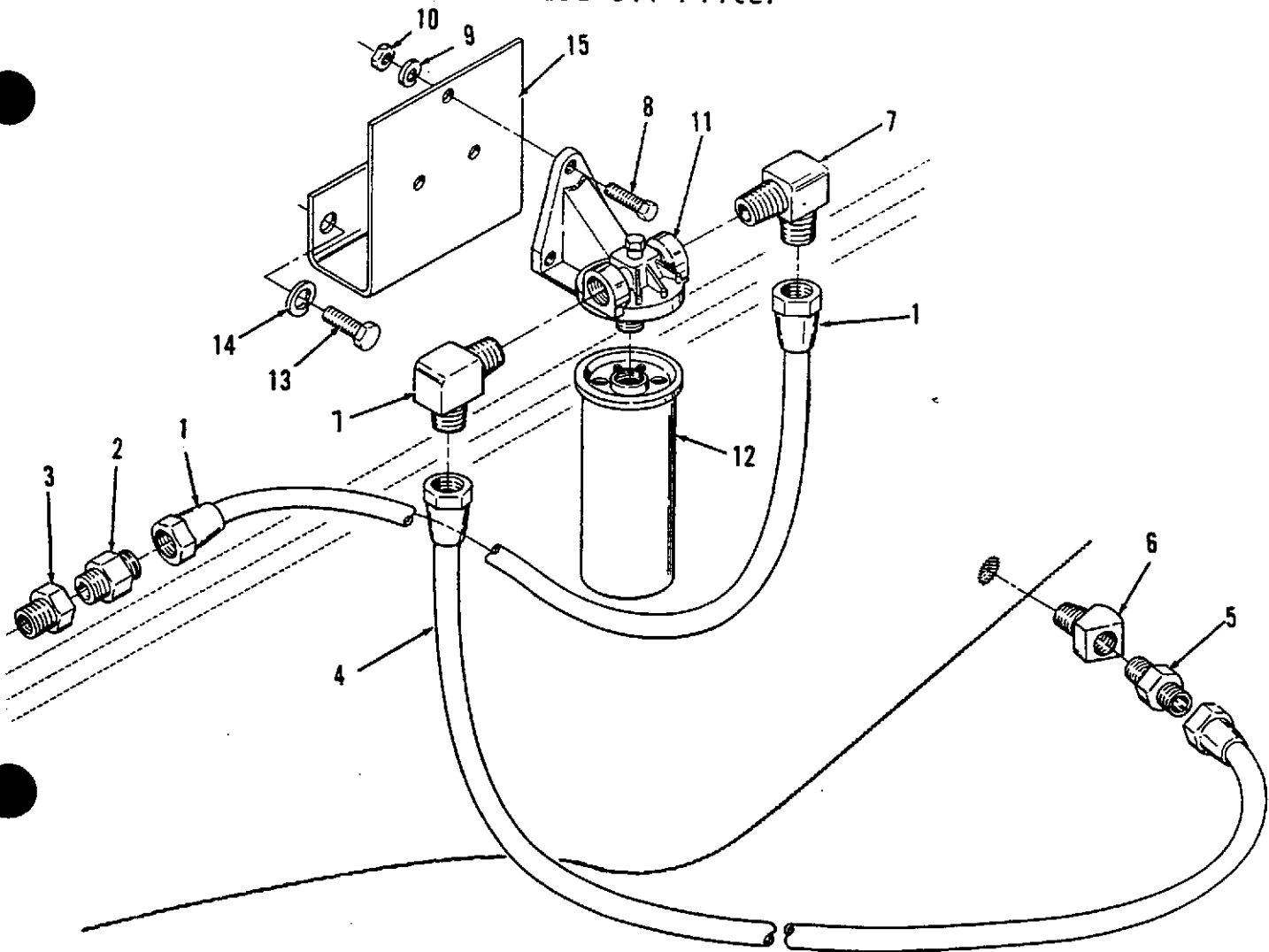


CS1136

Heater Horizontal Tank

REF NO.	PART NO.	QTY USED	PART DESCRIPTION	REF NO.	PART NO.	QTY USED	PART DESCRIPTION
1	501-0227	1	Line, Fuel	25	850-0040	4	Washer, Lock - Spring (1/4")
2	505-0037	1	Elbow, Pipe - 90 Degree	26	862-0001	4	Nut, Hex (1/4-20)
3	505-0007	2	Bushing, Reducer - Hex	27	333-0142	1	Support with Tee (1970 Thru 1982)
4	505-0038	1	Elbow, Pipe - 90 Degree	28	800-0052	2	Screw, Cap - Hex Head (3/8-16 x 1-1/2")
5	505-0324	1	Nipple, Pipe - Half	29	862-0003	2	Nut, Hex (3/8-16)
6	503-0429	4	Clamp, Hose	30	130-1191	2	Bracket, Mounting
7	503-0853	2	Hose	31	504-0003	1	Cock, Drain
8	505-0759	4	Adapter, Hose to Pipe	32			Heater, Electrical
9	505-0041	2	Elbow, Pipe - 90 Degree		333-0094	1	2500 Watt, 115 VAC - 1 Phase
10	505-0086	2	Nipple, Pipe		333-0169	1	2500 Watt, 208 VAC - 1 Phase
11	505-0304	1	Tee, Pipe		333-0165	1	2500 Watt, 208 VAC - 3 Phase
12	505-0004	2	Nipple, Pipe - Close		333-0131	1	2500 Watt, 240 VAC - 1 Phase
13	502-0390	1	Elbow, Pipe - Street, 90 Degree		333-0180	1	2500 Watt, 380 VAC - 1 Phase
14	505-0289	1	Bushing, Reducer - Hex		333-0211	1	2500 Watt, 380 VAC - 3 Phase
15	331-0027	2	Clamp, Cable		333-0166	1	2500 Watt, 480 VAC - 1 Phase
16	505-0333	1	Elbow, Pipe - Street, 45 Degree		333-0172	1	2500 Watt, 480 VAC - 3 Phase
17	331-0027	4	Clamp, Cable	33	505-0007	1	Bushing, Reducer - Hex (Begin 1983)
18	323-0957	2	Nut, Wire		502-0054	1	Elbow, Pipe - Street, 90 Degree (Begin 1983)
19	332-0149	8	Lug, Terminal	35	812-0079	4	Screw, Machine - Round Head (#8-32 x 1/2") (Begin 1983)
20	309-0490	1	Switch, Thermostatic	36	854-0007	4	Washer, Lock - ET (#8) (Begin 1983)
21	309-0307	1	Switch, Pressure - Oil	37	333-0224	1	Bracket, Support (Begin 1983)
22	505-0099	2	Nipple, Pipe - Close (1970 thru 1982)				
23			Contactor				
	307-1460	1	230 VAC, 3 Pole				
	307-1164	1	460 VAC, 3 Pole				
24	800-0007	4	Screw, Cap - Hex Head (1/4-20 x 1")				

Lube Oil Filter

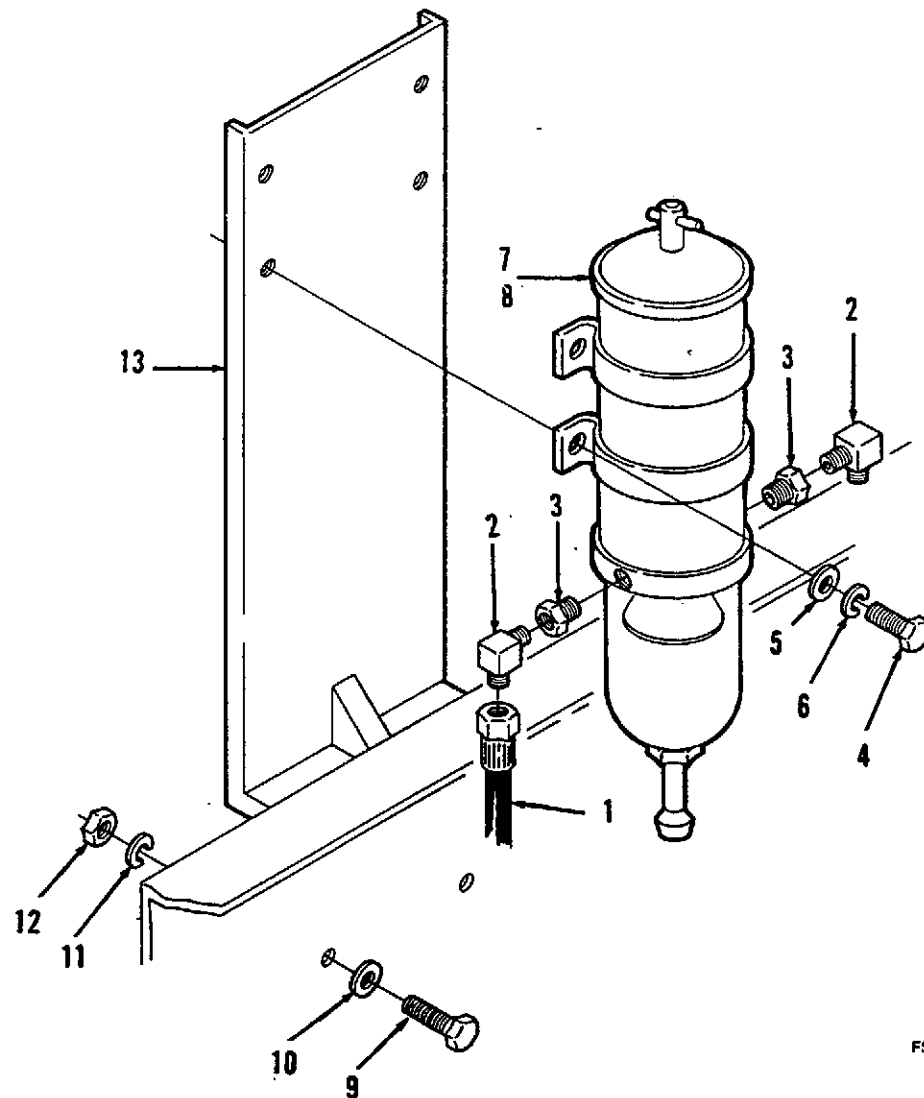


LS1071

REF NO.	PART NO.	QTY USED	PART DESCRIPTION
1	501-0382	1	Line, Fuel
2	502-0682	1	Nipple, Pipe - Hex
3	505-0021	1	Bushing, Reducer - Hex
4	501-0381	1	Line, Fuel
5	502-0594	1	Adapter, Line to Pipe
6	505-0248	1	Elbow, Pipe - 45 Degree
7	502-0277	2	Elbow, Pipe - 90 Degree
8	800-0053	3	Screw, Cap - Hex Head (3/8-16 x 1-3/4")

REF NO.	PART NO.	QTY USED	PART DESCRIPTION
9	850-0050	3	Washer, Lock - Spring (3/8")
10	862-0003	3	Nut, Hex (3/8-16)
11	122-0524	1	Head, Filter
12	122-0526	1	Element, Filter
13	801-0099	2	Screw, Cap - Hex Head (9/16-18 x 3/4")
14	850-0065	2	Washer, Lock - Spring (9/16")
15	122-0543	1	Bracket, Mounting

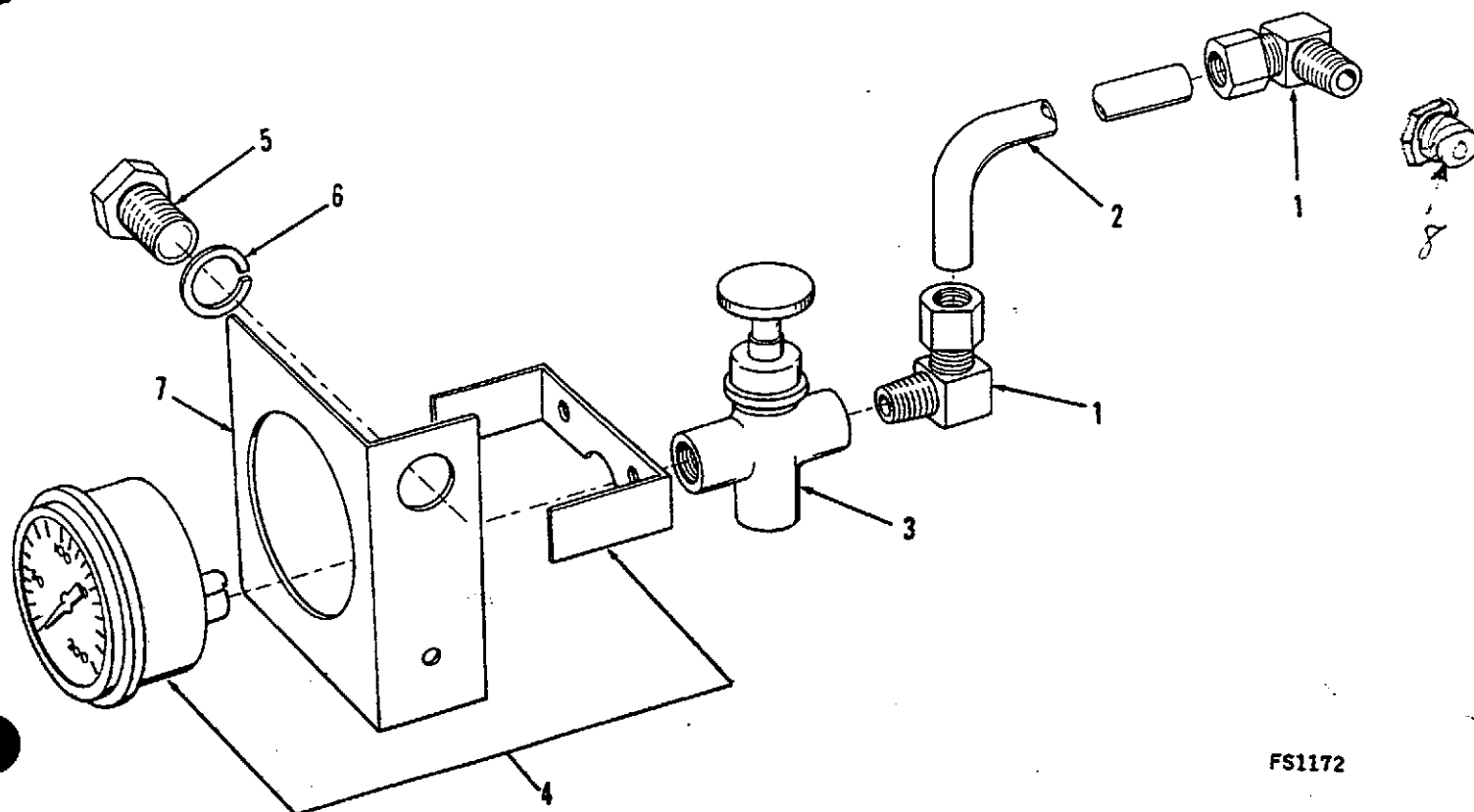
Fuel/Water Separator



FS 1374

REF NO.	PART NO.	QTY USED	PART DESCRIPTION	REF NO.	PART NO.	QTY USED	PART DESCRIPTION
1	501-0331	1	Line, Fuel	7	149-1625	1	Separator (Includes Element)
2	502-0702	2	Elbow, Pipe - Street - Male - 90 Degree	8	149-1689	1	Element
3	502-0701	2	Adapter, Pipe	9	800-0051	4	Screw, Cap - Hex Head (3/8-16 x 1-1/4")
4	800-0028	4	Screw, Cap - Hex Head (5/16-18 x 1")	10	526-0026	4	Washer, Flat (3/8")
5	526-0022	4	Washer, Flat (5/16")	11	850-0050	4	Washer, Lock - Spring (3/8")
6	850-0045	4	Washer, Lock - Spring (5/16")	12	862-0003	4	Nut, Hex (3/8-16)
				13	149-1716	1	Bracket, Mounting

Fuel Pressure Gauge

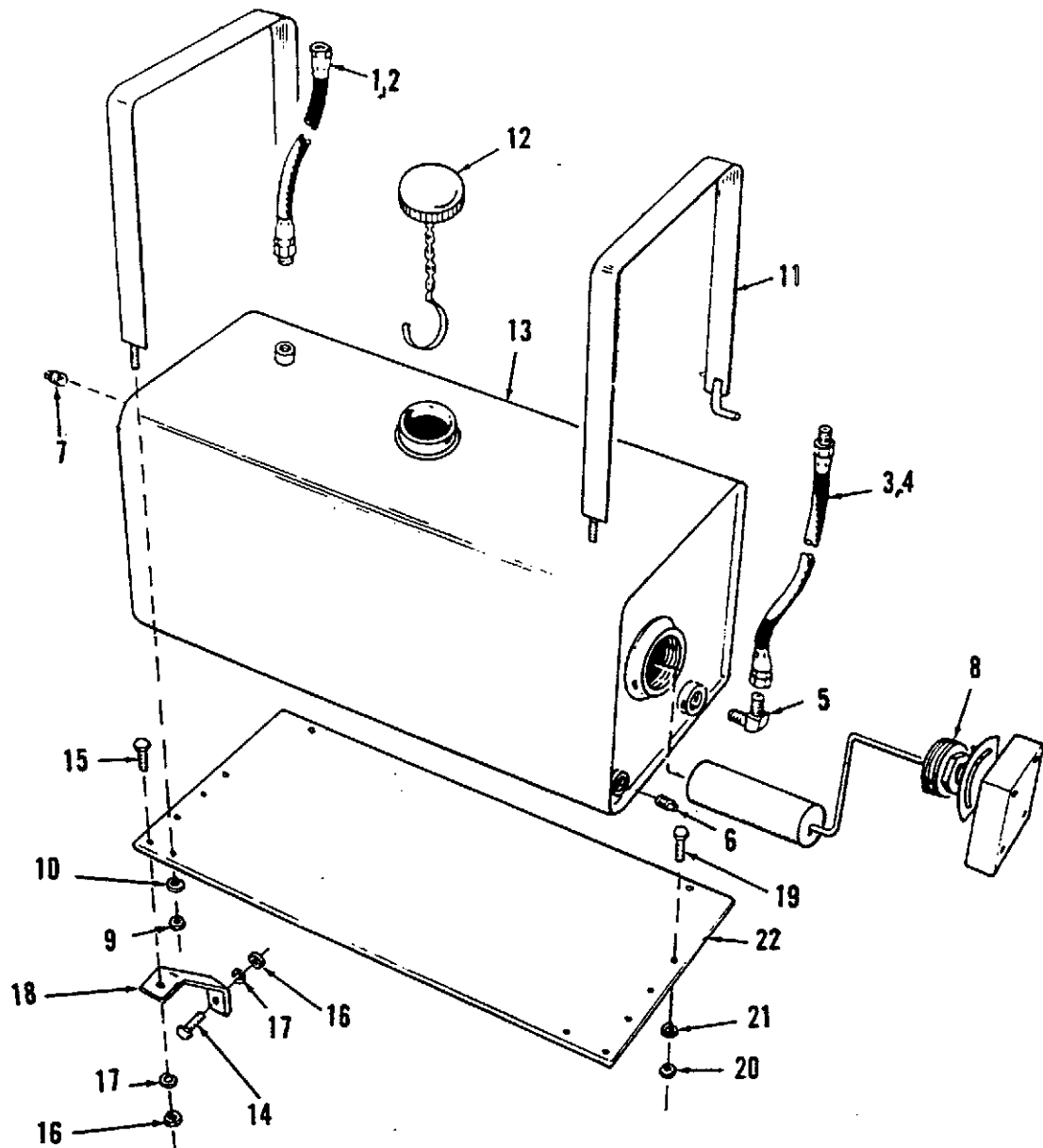


FS1172

REF NO.	PART NO.	QTY USED	PART DESCRIPTION
1	502-0034	2	Elbow, Tube - 90 Degree (Includes Nut and Ring)
2	375-4003	1	Tube, Copper
3	504-0064	1	Valve, Gate

REF NO.	PART NO.	QTY USED	PART DESCRIPTION
4	193-0128	1	Gauge, Pressure (Includes Bracket and Hardware)
5	800-0130	1	Screw, Cap - Hex Head (5/8-11 x 1")
6	850-0070	1	Washer, Lock - Spring (5/8")
7	193-0029	1	Bracket, Mounting
8	505-0017	1	Bushing, Reducer - 1/4 x 1/4 NPT x 1/8 NPT

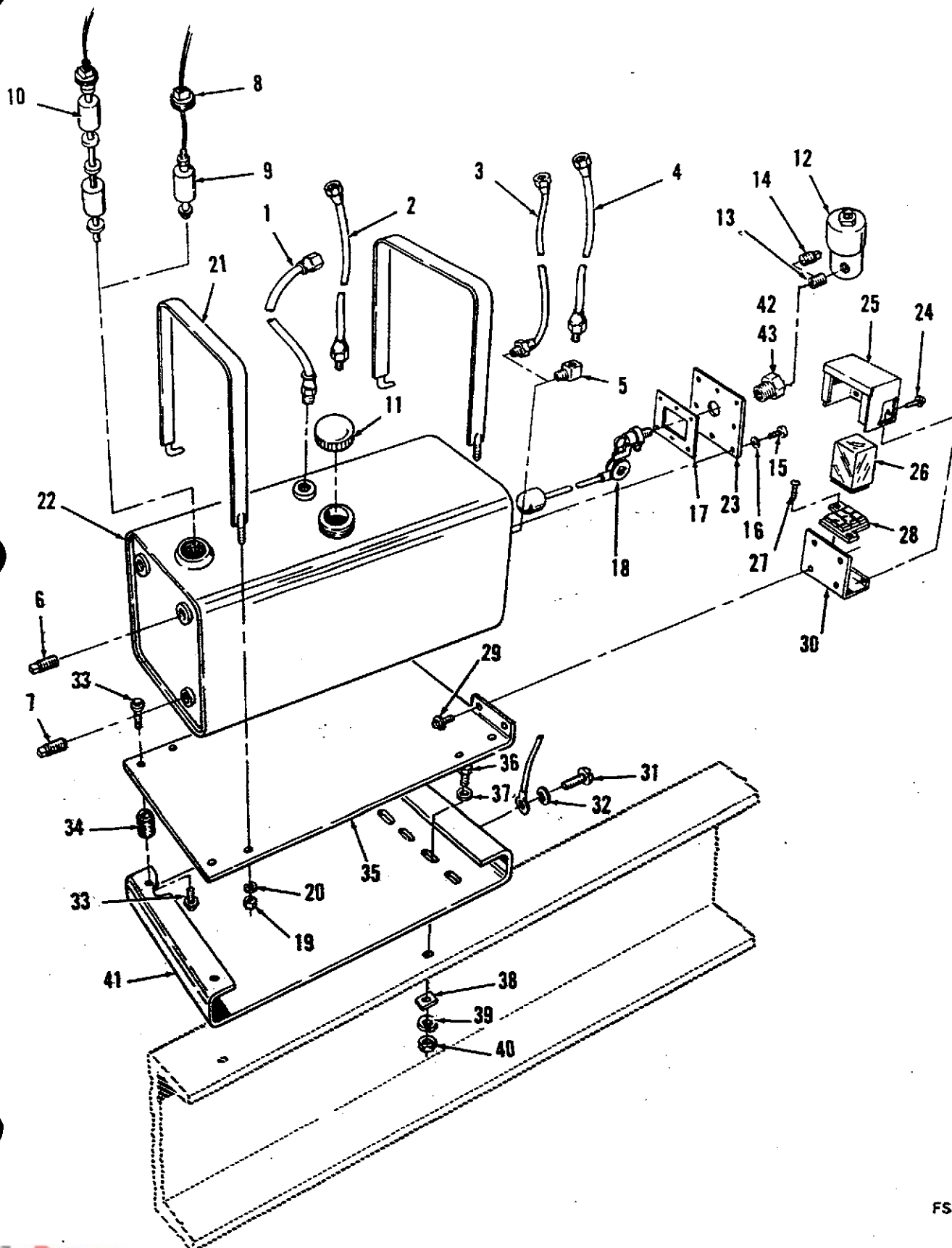
Fuel Tank



FS1171

REF NO.	PART NO.	QTY USED	PART DESCRIPTION	REF NO.	PART NO.	QTY USED	PART DESCRIPTION
1	501-0215	1	Line, Fuel (Housed Set)	13	415-0322	1	Tank, Fuel - 8-1/2 Gallon
2	501-0216	1	Line, Fuel (Unhoused Set)	14	800-0007	2	Screw, Cap - Hex Head (1/4-20 x 1")
3	501-0214	1	Line, Fuel (Housed Set)	15	800-0005	2	Screw, Cap - Hex Head (1/4-20 x 3/4")
4	501-0194	1	Line, Fuel (Unhoused Set)	16	862-0001	4	Nut, Hex (1/4-20)
5	502-0133	1	Elbow, Pipe - Street - 90 Degree (Unhoused Set)	17	850-0040	4	Washer, Lock - Spring (1/4")
6	505-0110	1	Plug, Pipe - Square Head	18	415-0329	2	Brace (Unhoused Set)
7	505-0056	1	Plug, Pipe - Square Head	19	800-0007	2	Screw, Cap - Hex Head. (1/4-20 x 1")
8	415-0170	1	Switch, Level	20	862-0001	2	Nut, Hex (1/4-20)
9	862-0001	2	Nut, Hex (1/4-20)	21	850-0040	2	Washer, Lock - Spring (1/4")
10	850-0040	2	Washer, Lock - Spring (1/4")	22	415-0330	1	Plate, Mounting
11	415-0331	2	Strap, Hold Down				
12	159-0020	1	Cap, Tank				

Fuel Tank Overhead/Underground Supply

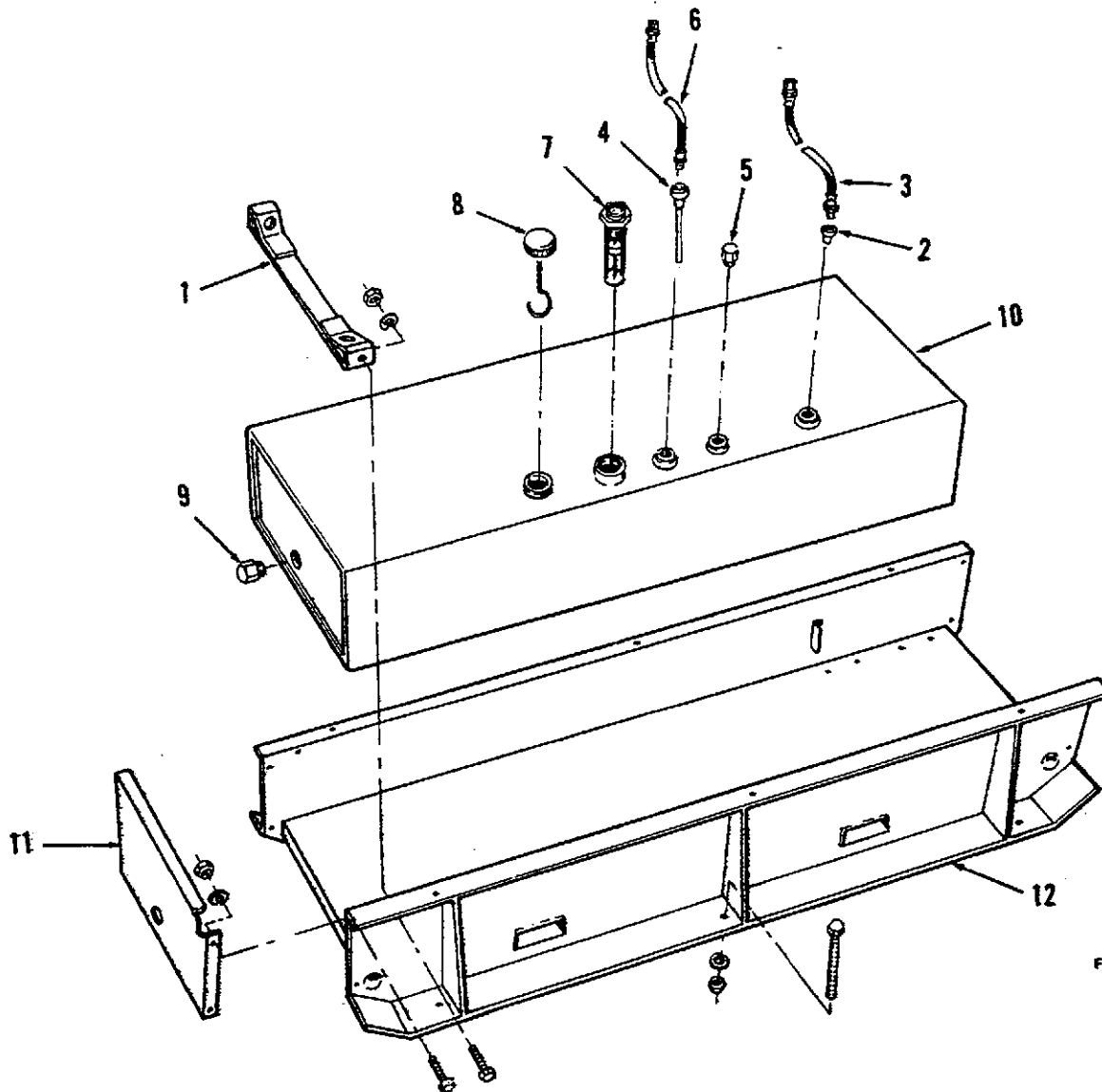


FS1334

Fuel Tank Overhead/Underground Supply

REF NO.	PART NO.	QTY USED	PART DESCRIPTION	REF NO.	PART NO.	QTY USED	PART DESCRIPTION
1	501-0215	1	Line, Fuel (Housed Set)	25	415-0464	1	Cover, Access
2	501-0216	1	Line, Fuel (Unhoused Set)	26	307-1056	1	Relay
3	501-0194	1	Line, Fuel (Housed Set)	27	812-0079	2	Screw, Machine - Round Head (#8-32 x 1/2")
4	501-0214	1	Line, Fuel (Unhoused Set)	28	323-0804	1	Socket, Relay
5	502-0133	1	Elbow, Pipe - Street - 90 Degree	29	821-0008	2	Screw, Self-locking - Hex (1/4-20 x 5/16")
6	505-0056	2	Plug, Pipe - Square Head	30	415-0463	1	Box
7	505-0110	1	Plug, Pipe - Square Head	31	813-0097	1	Screw, Machine - Round Head (#10-32 x 5/16")
8	505-1050	1	Plug, Pipe - Modified	32	850-0030	1	Washer, Lock - Spring (#10)
9	415-0466	1	Switch, Float (Overhead Supply)	33	821-0014	8	Screw, Self-locking - Hex (5/16-18 x 1/2")
10	415-0476	1	Switch, Float (Underground Supply)	34	402-0078	4	Mount, Vibration
11	159-0020	1	Cap, Tank	35	415-0479	1	Plate, Mounting
12	307-1816	1	Valve, Solenoid (Overhead Supply)	36	800-0093	2	Screw, Cap - Hex Head (1/2-13 x 1-3/4")
13	505-0098	1	Nipple, Pipe	37	526-0219	2	Washer, Flat (1/2")
14	505-0057	1	Plug, Pipe - Square Head (1970 thru Aug 1982)	38	526-0278	2	Washer, Bevel
15	800-0002	8	Screw, Cap - Hex Head (1/4-20 x 3/8")	39	850-0060	2	Washer, Lock - Spring (1/2")
16	526-0063	8	Washer, Flat (1/4")	40	862-0016	2	Nut, Hex (1/2-13)
17	415-0486	1	Gasket	41	415-0478	1	Bracket, Mounting
18	309-0404	1	Valve, Float (Overhead Supply)	42	505-0016	1	Bushing, Reducer - Hex (Begin Sept 1982)
19	862-0001	2	Nut, Hex (1/4-20)	43	505-0110	1	Plug, Pipe - Square Head (Begin Sept 1982)
20	850-0040	2	Washer, Lock - Spring (1/4")				
21	415-0509	2	Strap				
22	415-0465	1	Tank, Fuel - 8-1/2 Gallon				
23	415-0515	1	Plate, Access				
24	821-0004	2	Screw, Self-locking - Hex (#10-32 x 5/16")				

Fuel Tank and Sub Base

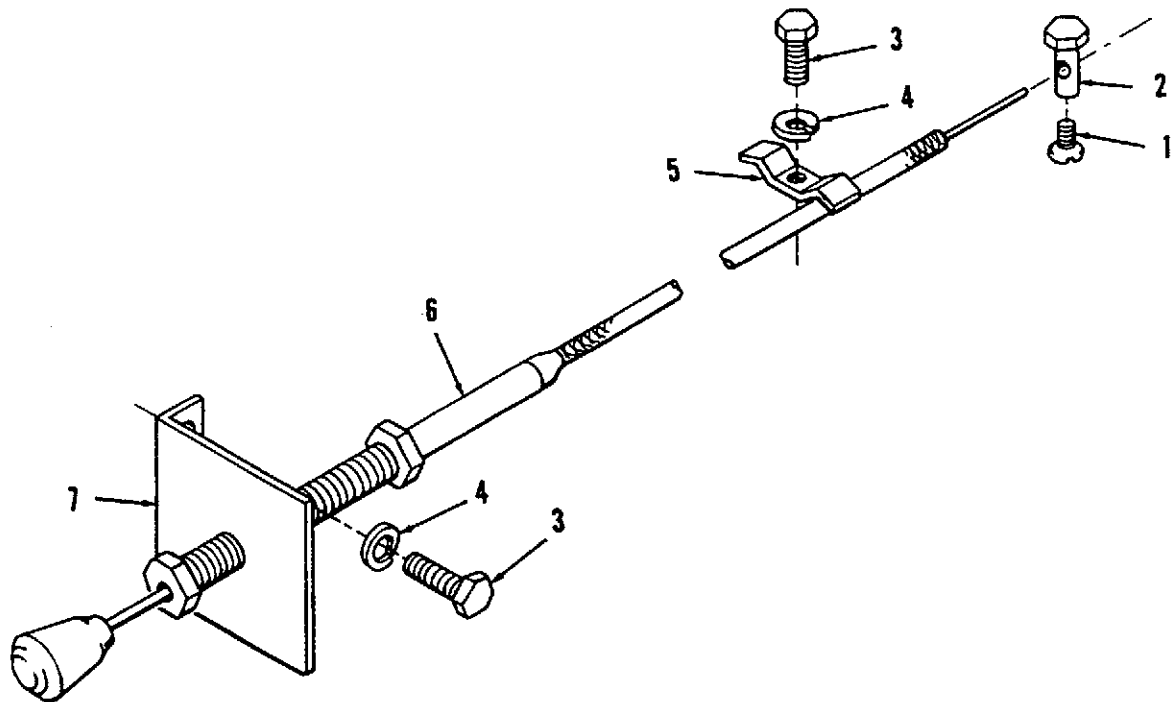


FS-1168

REF NO.	PART NO.	QTY USED	PART DESCRIPTION
1	159-1100	2	Strap, Hold Down
	800-0051	4	Screw, Cap - Hex Head (3/8-16 x 1-1/4")
	526-0013	4	Washer, Flat (3/8")
	850-0050	4	Washer, Lock - Spring (3/8")
	862-0003	4	Nut, Hex (3/8-16)
2	502-0297	1	Bushing, Reducer - Hex
3	501-0211	1	Line, Fuel
4	415-0317	1	Pipe, Suction
5	505-0334	1	Plug, Pipe - Square Head
6	501-0214	1	Line, Fuel
7	193-0216	1	Gauge
8	159-0020	1	Cap, Tank

REF NO.	PART NO.	QTY USED	PART DESCRIPTION
9	505-0247	1	Plug, Pipe - Socket Head
10	159-1101	1	Tank, Fuel
11	403-1743	2	Plate, End
	800-0050	8	Screw, Cap - Hex Head (3/8-16 x 1")
	850-0050	8	Washer, Lock - Spring (3/8")
	862-0003	8	Nut, Hex (3/8-16)
12	403-1896	1	Base, Sub
	800-0156	6	Screw, Cap - Hex Head (3/4-10 x 2-1/4")
	850-0079	6	Washer, Lock - Spring (3/4")
	862-0020	6	Nut, Hex (3/4-10)

Vernier Throttle

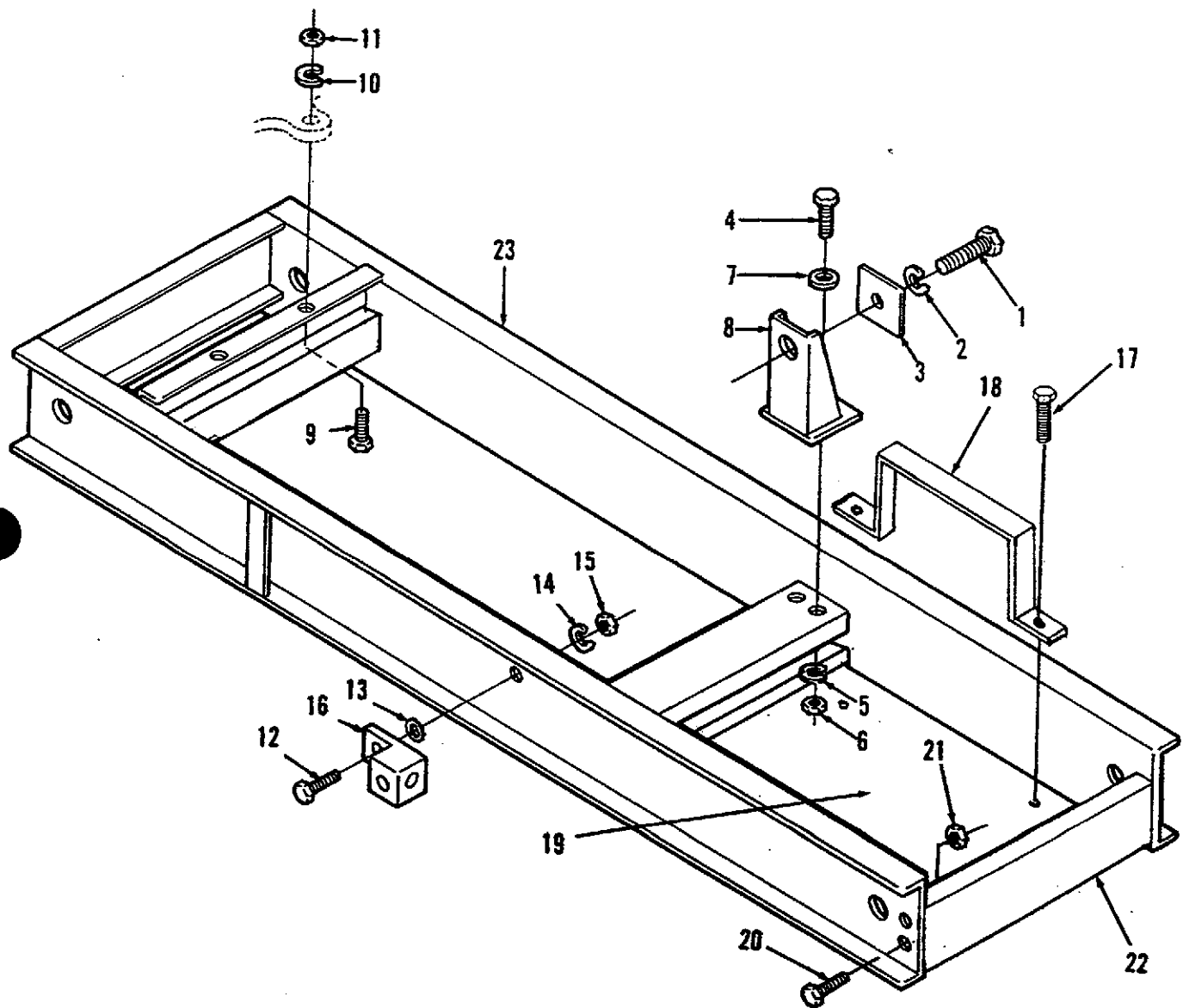


M1179

REF NO.	PART NO.	QTY USED	PART DESCRIPTION
1	812-0075	1	Screw, Machine - Round Head (#8-32 x 1/2")
2	152-0158	1	Swivel
3	800-0005	3	Screw, Cap - Hex Head (1/4-20 x 3/4")

REF NO.	PART NO.	QTY USED	PART DESCRIPTION
4	850-0040	3	Washer, Lock - Spring (1/4")
5	152-0036	1	Clamp, Cable
6	152-0120	1	Throttle, Vernier
7	151-0230	1	Bracket, Mounting

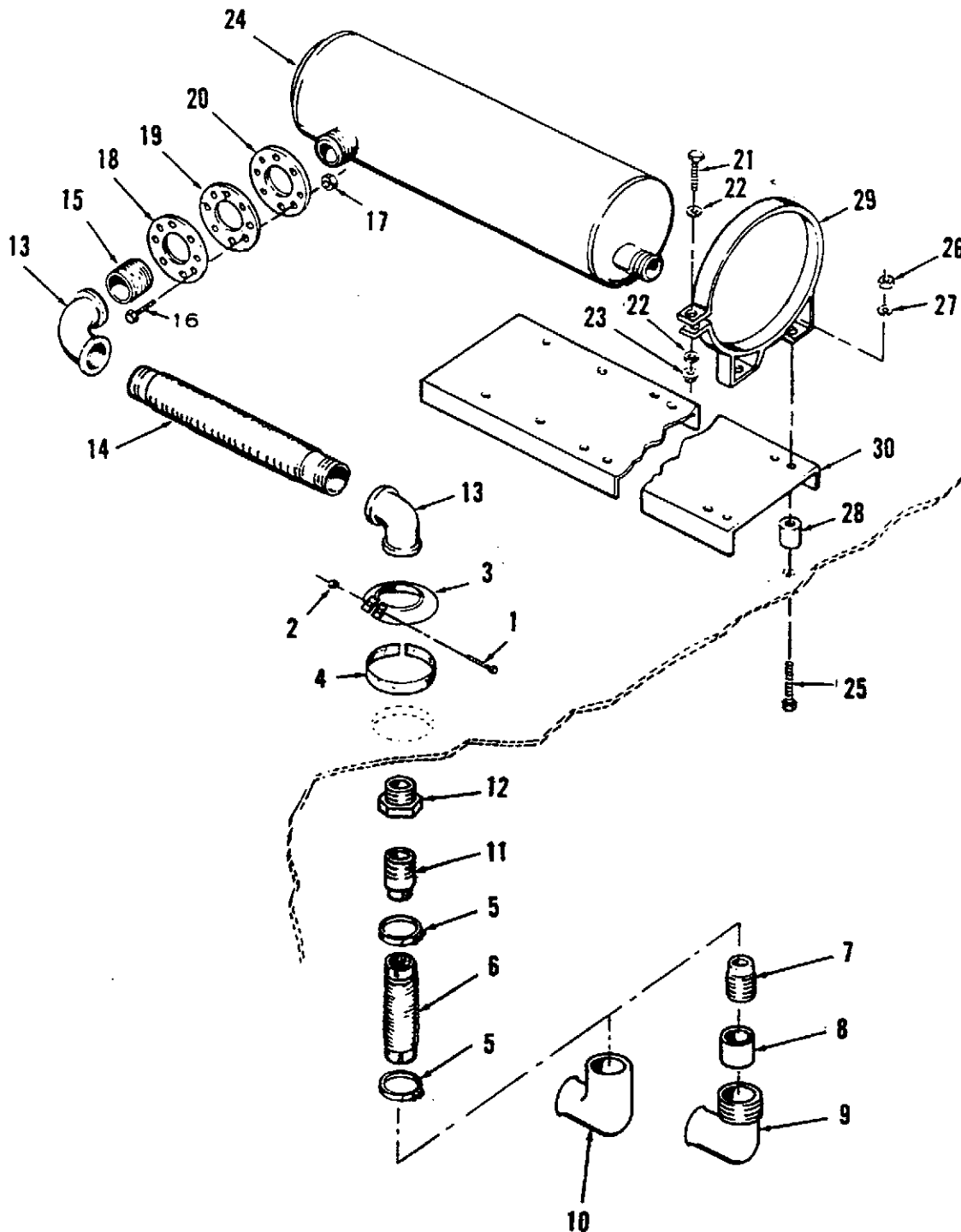
Chassis



Chassis

REF NO.	PART NO.	QTY USED	PART DESCRIPTION	REF NO.	PART NO.	QTY USED	PART DESCRIPTION
1	800-0153	2	Screw, Cap - Hex Head (3/4-10 x 1-1/2")	13	856-0008	1	Washer, Lock - EIT (5/16")
2	850-0079	2	Washer, Lock - Spring (3/4")	14	850-0045	1	Washer, Lock - Spring (5/16")
3	232-2385	2	Plate, Mounting - Generator	15	870-0257	1	Nut, Self-locking - Hex (5/16-18)
4	800-0156	4	Screw, Cap - Hex Head (3/4-10 x 2-1/2")	16	332-1473	1	Lug, Terminal
5	850-0079	4	Washer, Lock - Spring (3/4")	17	800-0035	4	Screw, Cap - Hex Head (5/16-18 x 2-1/2")
6	862-0020	4	Nut, Hex (3/4-10)	18	416-0635	2	Strap, Holddown - Battery
7	526-0238	2	Washer, Flat (3/4")	19	416-0674	1	Tray, Battery
8	232-2389	2	Bracket, Mounting - Generator	20	821-0016	6	Screw, Self-locking - Hex (5/16-18 x 3/4")
9	800-0138	2	Screw, Cap - Hex Head (5/8-11 x 3")	21	870-0257	6	Nut, Self-locking - Hex (5/16-18)
10	850-0070	2	Washer, Lock - Spring (5/8")	22	403-1200	1	Panel, Rear - Chassis
11	862-0007	2	Nut, Hex (5/8-11)	23	403-1203	1	Base, Skid
12	800-0028	1	Screw, Cap - Hex Head (5/16-18 x 1")				

Exhaust Muffler Commerical

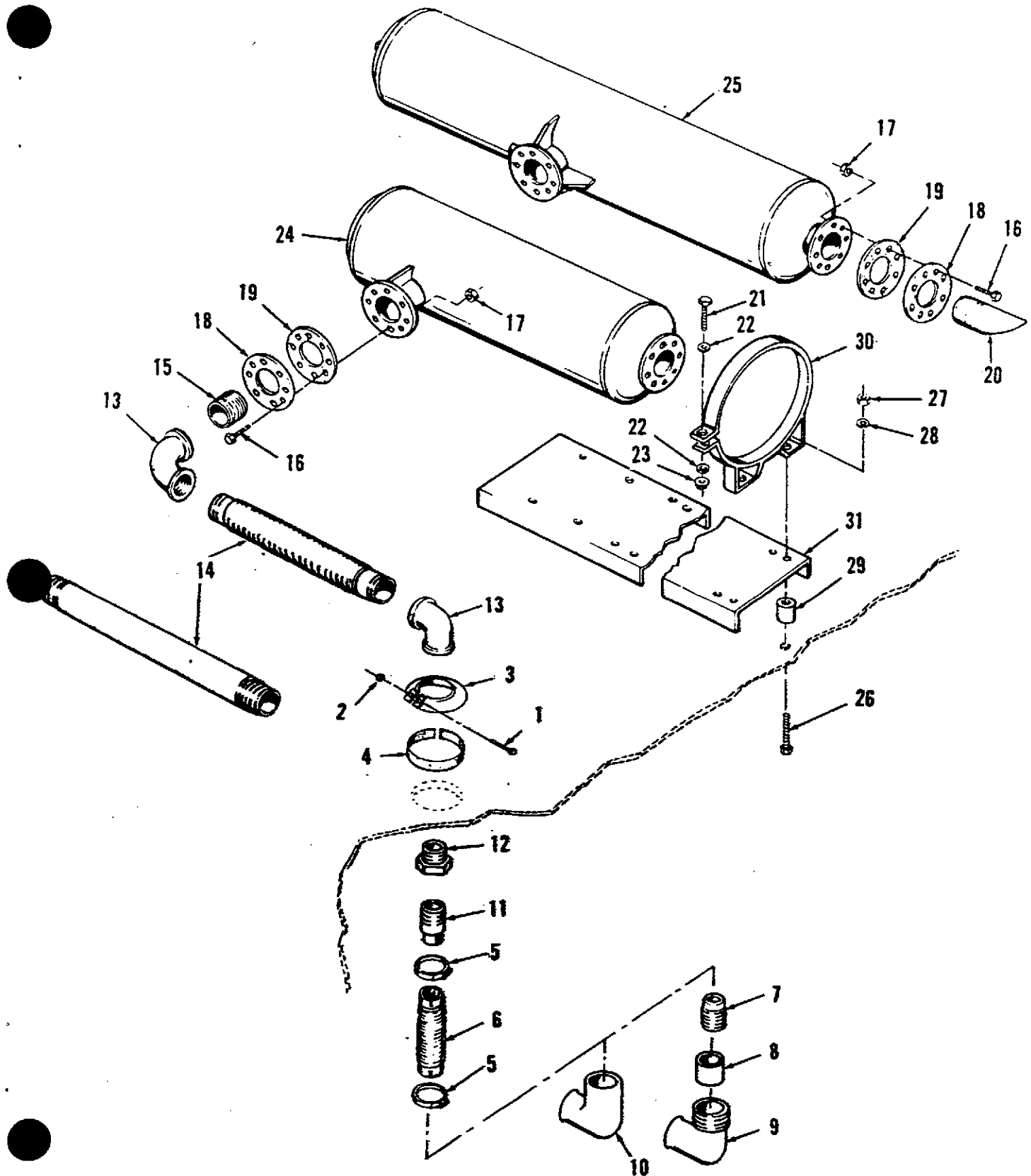


EXS1056

Exhaust Muffler Commerical

REF NO.	PART NO.	QTY USED	PART DESCRIPTION	REF NO.	PART NO.	QTY USED	PART DESCRIPTION
1	813-0105	2	Screw, Machine - Round Head (#10-32 x 1")	14	155-1160	1	Tube, Exhaust Standard
2	870-0188	2	Nut, Self-locking - Hex (#10-32)		155-1184	1	Stainless Steel
3			Shield, Rain Standard	15	505-0740	1	Nipple, Pipe - Short ..
	155-1425	1	Stainless Steel	16	800-0160	8	Screw, Cap - Hex Head (3/4-10 x 3-1/4")
	155-1639	1	Strip, Asbestos	17	862-0008	8	Nut, Hex (3/4-10)
4	895-0163	1	Clamp	18	155-0652	1	Flange, Companion - Pipe
5	503-0605	2	Tube, Exhaust - Stainless Steel	19	155-0676	1	Gasket
6			10"	20	155-0652	1	Flange, Companion - Pipe
	155-1143	1	13"	21	800-0037	3	Screw, Cap - Hex Head (5/16-18 x 3")
	155-1603	1	16"	22	526-0113	6	Washer, Flat (5/16")
	155-1456	1	21"	23	870-0257	3	Nut, Self-locking - Hex (5/16-18)
	155-1299	1	33"	24	155-1158	1	Muffler, Exhaust
	155-1293	1	Connector, Tube	25	800-0037	6	Screw, Cap - Hex Head (5/16-18 x 3")
7	155-1275	1	Coupling, Pipe	26	870-0048	6	Nut, Self-locking - Hex (5/16-18)
8	505-0784	1	Elbow, Pipe	27	850-0045	6	Washer, Lock - Spring (5/16")
9	155-1035	1	Elbow, Tube	28	155-1430	6	Spacer
10	155-1736	1	Connector, Tube	29	140-0757	3	Band, Mounting
11			6"	30	155-1404	1	Shield, Heat
	155-1275	1	17"				
	155-1929	1	Bushing, Reducer - Hex				
12	505-0695	1	Elbow, Pipe - 90 Degree				
13	505-0741	2					

Exhaust Muffler Residential and Critical

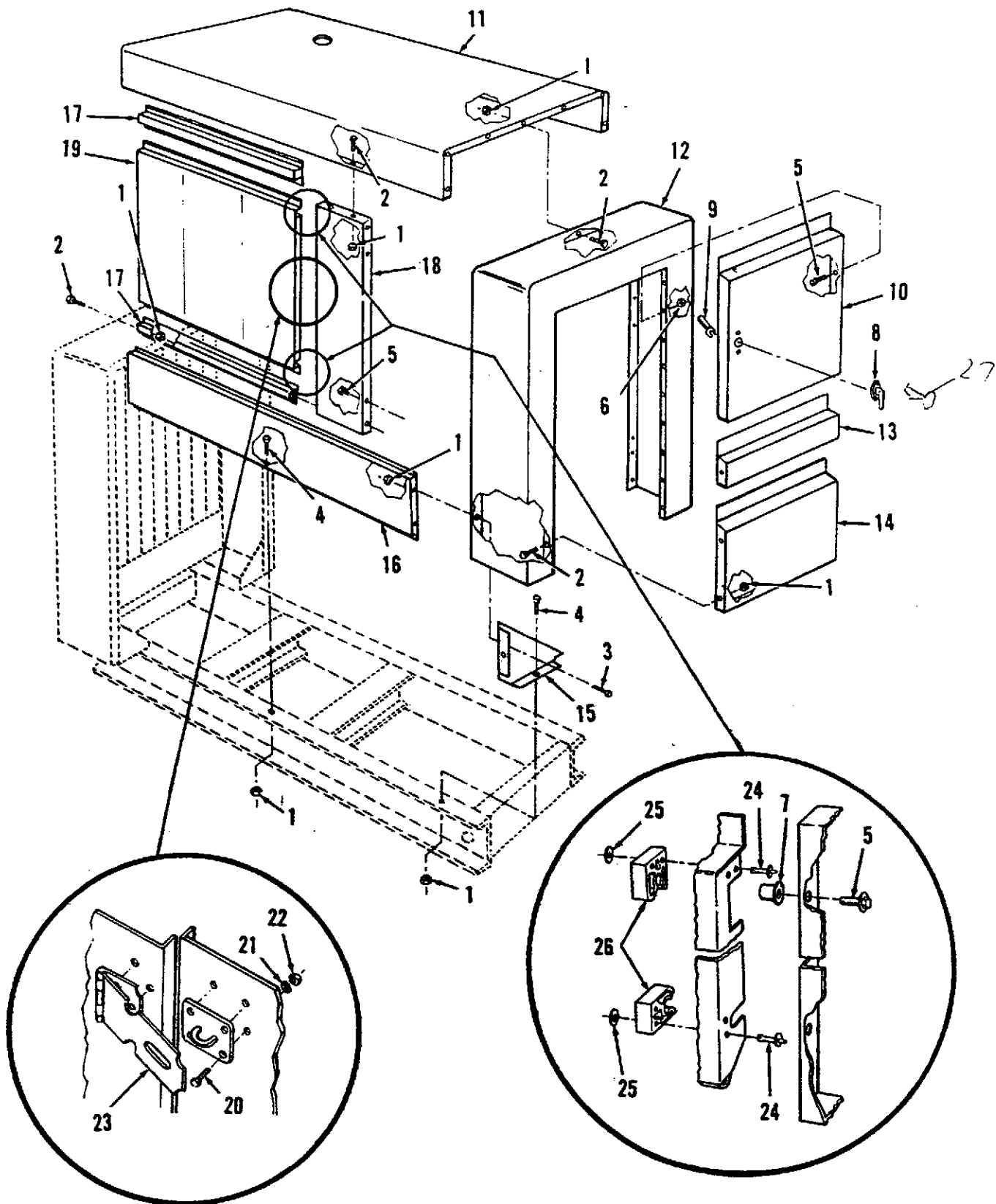


EXS1057

Exhaust Muffler Residential and Critical

REF NO.	PART NO.	QTY USED	PART DESCRIPTION	REF NO.	PART NO.	QTY USED	PART DESCRIPTION
1	813-0105	2	Screw, Machine - Round Head (#10-32 x 1")	16	800-0160	16	Screw, Cap - Hex Head (3/4-10 x 3-1/4")
2	870-0188	2	Nut, Self-locking - Hex (#10-32)	17	862-0008	16	Nut, Hex (3/4-10)
3			Shield, Rain	18	155-0652	2	Flange, Companion - Pipe
	155-1425	1	Standard	19	155-0676	2	Gasket
	155-1639	1	Stainless Steel	20	505-0785	1	Nipple, Pipe - Modified
4	895-0163	1	Strip, Asbestos	21	800-0037	3	Screw, Cap - Hex Head (5/16-18 x 3")
5	503-0605	2	Clamp	22	526-0113	6	Washer, Flat (5/16")
6			Tube, Exhaust - Stainless Steel	23	870-0257	3	Nut, Self-locking - Hex (5/16-18)
	155-1143	1	10"				Muffler, Exhaust - Residential
	155-1603	1	13"	24	155-1605	1	Standard
	155-1456	1	16"		155-1727	1	Stainless Steel
	155-1299	1	21"	25			Muffler, Exhaust - Critical
	155-1493	1	22-1/2"		155-1568	1	Standard
	155-1293	1	33"		155-1728	1	Stainless Steel
7	155-1275	1	Connector, Tube	26	800-0037	6	Screw, Cap - Hex Head (5/16-18 x 3")
8	505-0784	1	Coupling, Pipe	27	870-0048	6	Nut, Self-locking - Hex (5/16-18)
9	155-1035	1	Elbow, Pipe	28	850-0045	6	Washer, Lock - Spring (5/16")
10	155-1736	1	Elbow, Tube	29	155-1430	6	Spacer
11			Connector, Tube	30			Band, Mounting
	155-1275	1	6"		140-0751	3	Standard
	155-1929	1	17"		140-1685	3	Stainless Steel
12	505-0695	1	Bushing, Reducer - Hex	31			Shield, Heat
13	505-0741	2	Elbow, Pipe - 90 Degree		155-1400	1	Standard, 67"
14			Tube, Exhaust		155-1729	1	Stainless Steel, 67"
	155-1604	1	Tube, 38"		155-1602	1	Standard, 94"
	155-1619	1	Tube, 55"		155-1730	1	Stainless Steel, 94"
	505-0939	1	Pipe, 43"				
15	505-0740	1	Nipple, Pipe - Short				

Set Housing



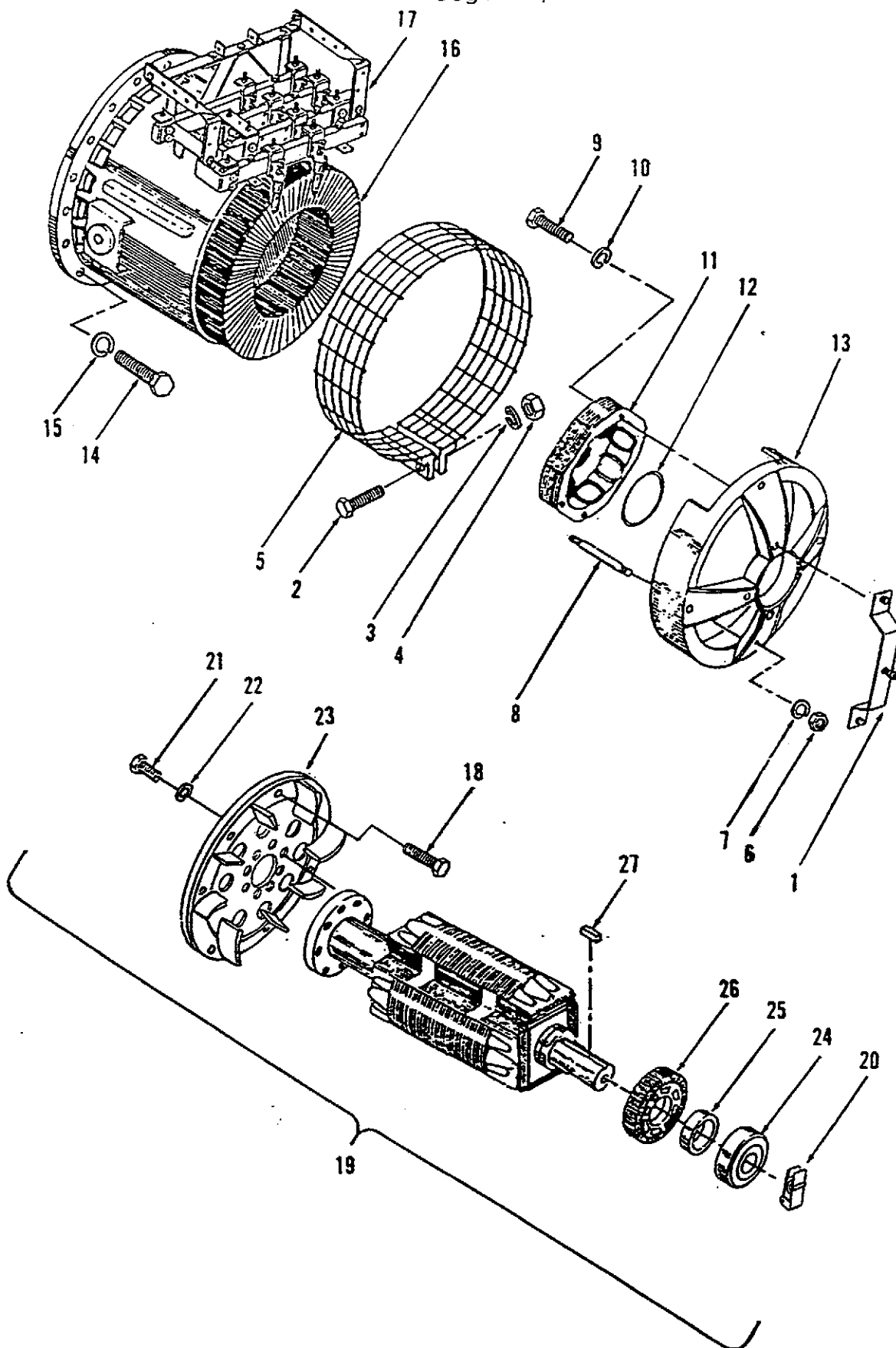
M1004

Set Housing

REF NO.	PART NO.	QTY USED	PART DESCRIPTION	REF NO.	PART NO.	QTY USED	PART DESCRIPTION
1	870-0257	62	Nut, Self-locking - Hex (5/16-18)	11	405-2222	1	Panel, Top
2	821-0014	48	Screw, Self-locking - Hex (5/16-18 x 1/2")	12	405-1883	1	Panel, Rear
3	821-0016	8	Screw, Self-locking - Hex (5/16-18 x 3/4")	13	405-1858	2	Panel, Louver - Rear
4	800-0030	6	Screw, Cap - Hex Head (5/16-18 x 1-1/4")	14	405-1856	1	Panel, Lower - Rear
5	821-0010	20	Screw, Self-locking - Hex (1/4-20 x 1/2")	15	405-2016	4	Bracket, Mounting
6	870-0212	4	Nut, Self-locking - Hex (1/4-20)	16	405-2221	2	Panel, Base
7	870-0258	16	Nut, Weld	17	405-2014	8	Panel, Louver
8	406-0157	1	Handle, Lock	18	405-2220	2	Panel, Center
9	406-0089	1	Catch	19	405-2011	4	Door
10	405-1880	1	Door, Rear	20	814-0079	28	Screw, Machine - Flat Head (#8-32 x 1/2")
				21	850-0025	28	Washer, Lock - Spring (#8)
				22	860-0008	28	Nut, Hex (#8-32)
				23	406-0249	4	Set, Hasp
				24	818-0150	32	Rivet, Drive Pin
				25	526-0003	32	Washer, Flat (3/16")
				26	405-1872	16	Clip, Pivot - Door

27 406-0565 / Key

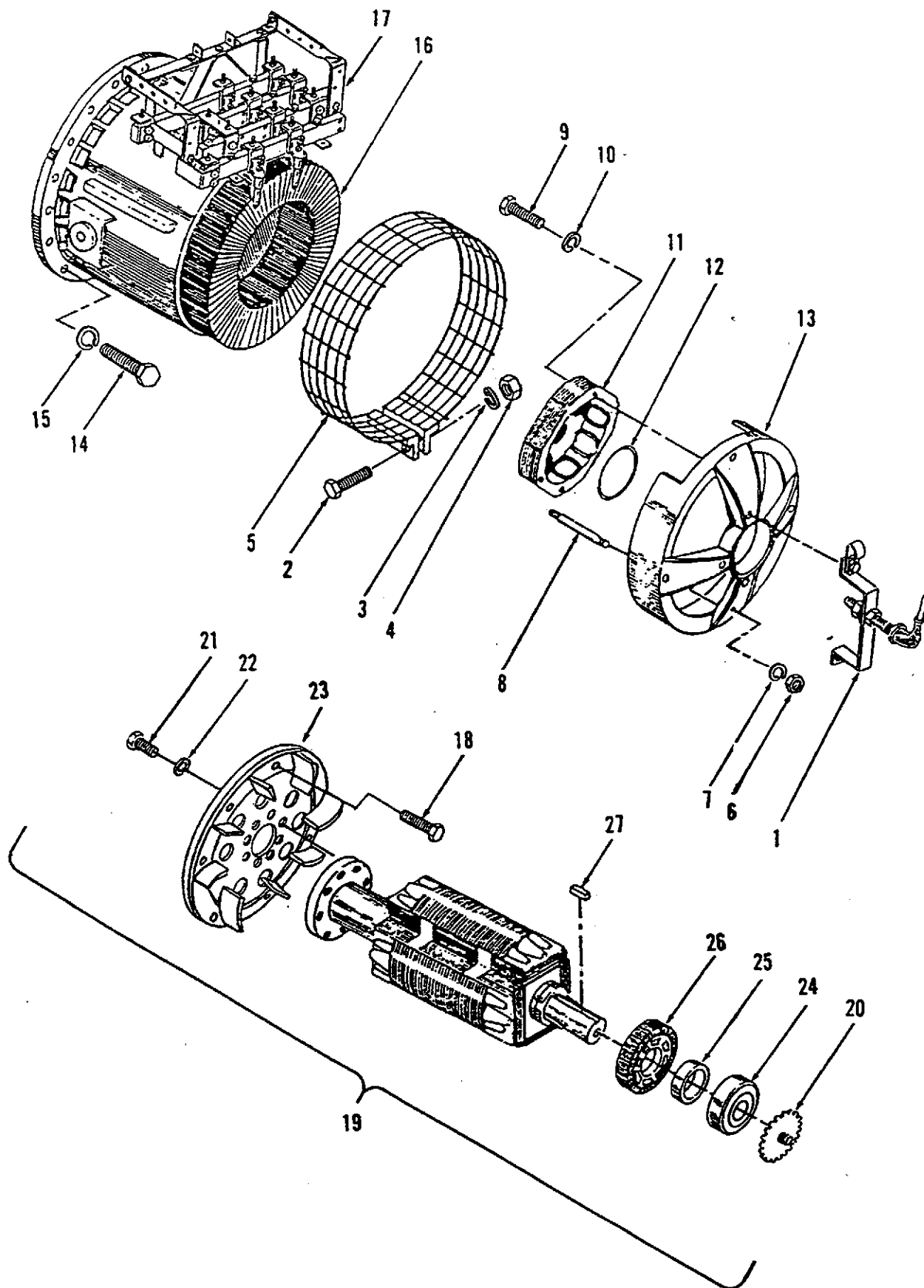
Generator
Begin Spec M



Generator
Begin Spec M

REF NO.	PART NO.	QTY USED	PART DESCRIPTION	REF NO.	PART NO.	QTY USED	PART DESCRIPTION
1		1	Switch Assembly, Overspeed (See Separate Page for Components)	17		1	Bus Bar Assembly (See Separate Page for Components)
2	114-0023	2	Screw, Cap - Hex Head (1/4-20 x 1-1/4")	18	805-0032	8	Bolt, Hex Head - Grade 8 (1/2-13 x 1-1/4")
3	850-0040	2	Washer, Lock - Spring (1/4")	19			Rotor Assembly (Includes Disk and Fan Assembly, Bearing, Exciter Rotor, Overspeed Switch
4	862-0001	2	Nut, Hex (1/4-20)		201-3328	1	165kW, Code 517
5	234-0455	1	Screen, Air		201-3328	1	200kW, Code 5, 6, 7, 9, 17
6	862-0016	4	Nut, Hex (1/2-13)	20	201-3328	1	Switch Assembly, Overspeed (See Separate Page for Components)
7	850-0060	4	Washer, Lock - Spring (1/2")				
8	620-0780	4	Stud (1/2-13 x 6-1/2")	21	805-0035	8	Bolt, Hex Head - Grade 8 (5/8-11 x 1-1/2")
9	800-0009	4	Screw, Cap - Hex Head (1/4-20 x 1-1/2")	22	526-0259	8	Washer, Flat - Hardened Steel (5/8")
10	850-0040	4	Washer, Lock - Spring (1/4")	23	232-2898	1	Disk and Fan Assembly (Matched Pair)
11	220-1920	1	Stator, Exciter	24	510-0106	1	Bearing, Ball
12	509-0151	1	Seal, Oil - "O" Ring	25	232-2317	1	Spacer, Sleeve
13	211-0214	1	Bell, End	26	201-1902	1	Rotor, Assembly - Exciter (See Separate Page for Components)
14	800-0073	12	Screw, Cap - Hex Head (7/16-14 x 1-1/2")	27	515-0145	1	Key, Machine
15	850-0055	12	Washer, Lock - Spring (7/16")				
16			Stator (Includes Bus Bar Assembly)				
	220-2135	1	165kW, Code 517				
	220-2341	1	200kW, Code 5				
	220-2347	1	200kW, Code 6				
	220-2443	1	200kW, Code 7				
	220-2317	1	200kW, Code 9				
	220-1912	1	200kW, Code 17				
	220-2610	1	200kW, Code 17 ENVIRONMENTALLY PROTECTED				

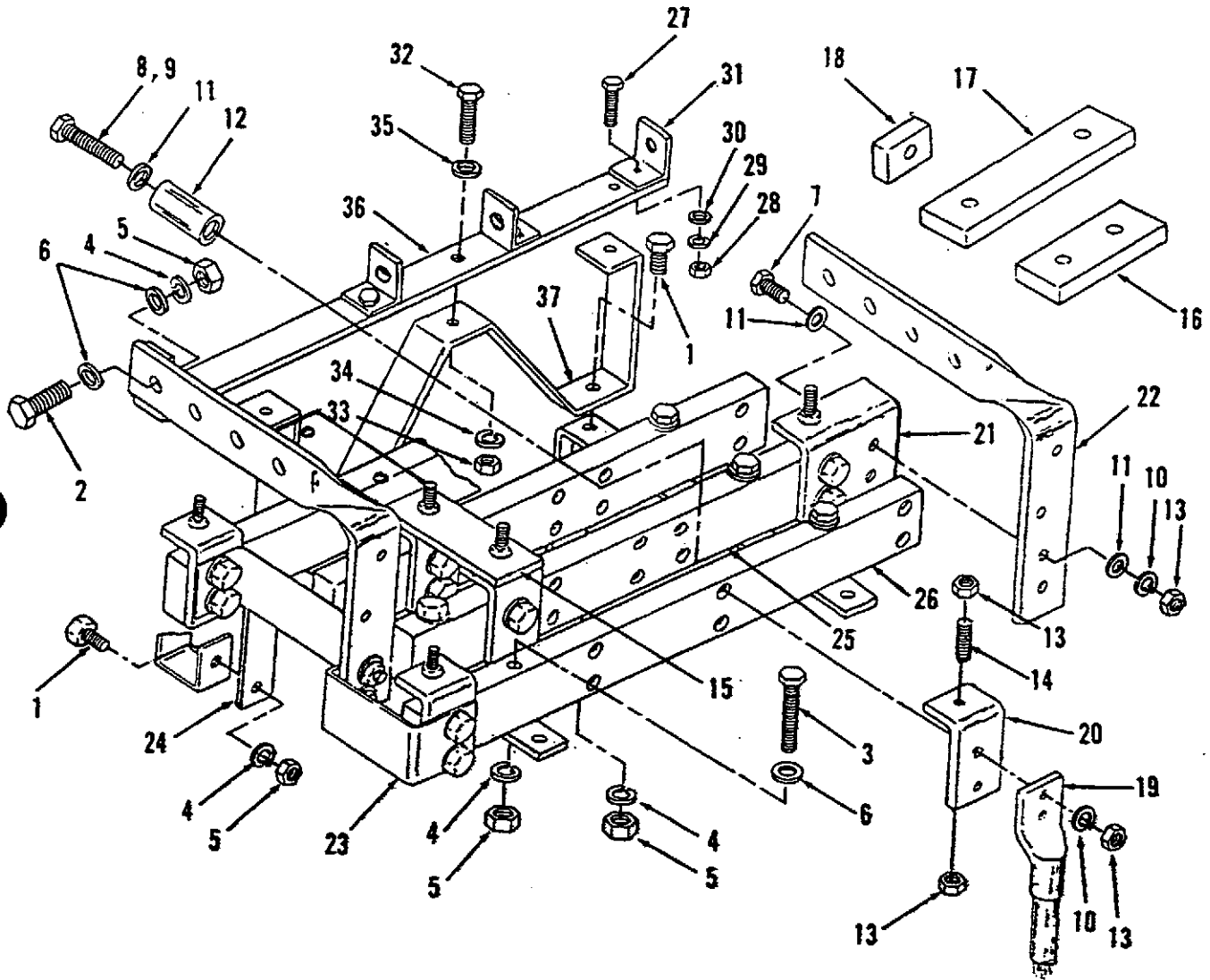
Generator
Spec H thru L



Generator Spec H thru L

REF NO.	PART NO.	QTY USED	PART DESCRIPTION	REF NO.	PART NO.	QTY USED	PART DESCRIPTION
1		1	Sensor Assembly, Overspeed (See Separate Page for Components)	17		1	Bus Bar Assembly (See Separate Page for Components)
2	114-0023	2	Screw, Cap - Hex Head (1/4-20 x 1-1/4")	18	805-0032	8	Bolt, Hex Head - Grade 8 (1/2-13 x 1-1/4")
3	850-0040	2	Washer, Lock - Spring (1/4")	19			Rotor Assembly (Includes Disk and Fan Assembly, Bearing, Exciter Rotor and Overspeed Sensor)
4	862-0001	2	Nut, Hex (1/4-20)				
5	234-0455	1	Screen, Air		201-1940	1	165kW, Code 517
6	862-0016	4	Nut, Hex (1/2-13)		201-1942	1	190kW, Code 517
7	850-0060	4	Washer, Lock - Spring (1/2")		201-1940	1	200kW, Code 5, 6, 7, 9, 17
8	620-0780	4	Stud (1/2-13 x 6-1/2")		201-1942	1	275kW, Code 5, 6, 7, 9, 17
9	800-0009	4	Screw, Cap - Hex Head (1/4-20 x 1-1/2")	20		1	Switch Assembly, Overspeed (See Separate Page for Components)
10	850-0040	4	Washer, Lock - Spring (1/4")				
11	220-1920	1	Stator, Exciter	21	805-0035	8	Bolt, Hex Head - Grade 8 (5/8-11 x 1-1/2")
12	509-0151	1	Seal, Oil - "O" Ring	22	526-0259	8	Washer, Flat - Hardened Steel (5/8")
13	211-0214	1	Bell, End	23	232-2898	1	Disk and Fan Assembly (Matched Pair)
14	800-0073	12	Screw, Cap - Hex Head (7/16-14 x 1-1/2")	24	510-0106	1	Bearing, Ball
15	850-0055	12	Washer, Lock - Spring (7/16")	25	232-2317	1	Spacer, Sleeve
16			Stator (Includes Bus Bar Assembly)	26	201-1902	1	Rotor, Assembly - Exciter (See Separate Page for Components)
	220-2135	1	165kW, Code 517	27	515-0145	1	Key, Machine (Matched Pair)
	220-2136	1	190kW, Code 517				
	220-2341	1	200kW, Code 5				
	220-2347	1	200kW, Code 6				
	220-2443	1	200kW, Code 7				
	220-2317	1	200kW, Code 9				
	220-1912	1	200kW, Code 17				
	220-2342	1	230kW, Code 5				
	220-2348	1	230kW, Code 6				
	220-2318	1	230kW, Code 9				
	220-1913	1	230kW, Code 17				

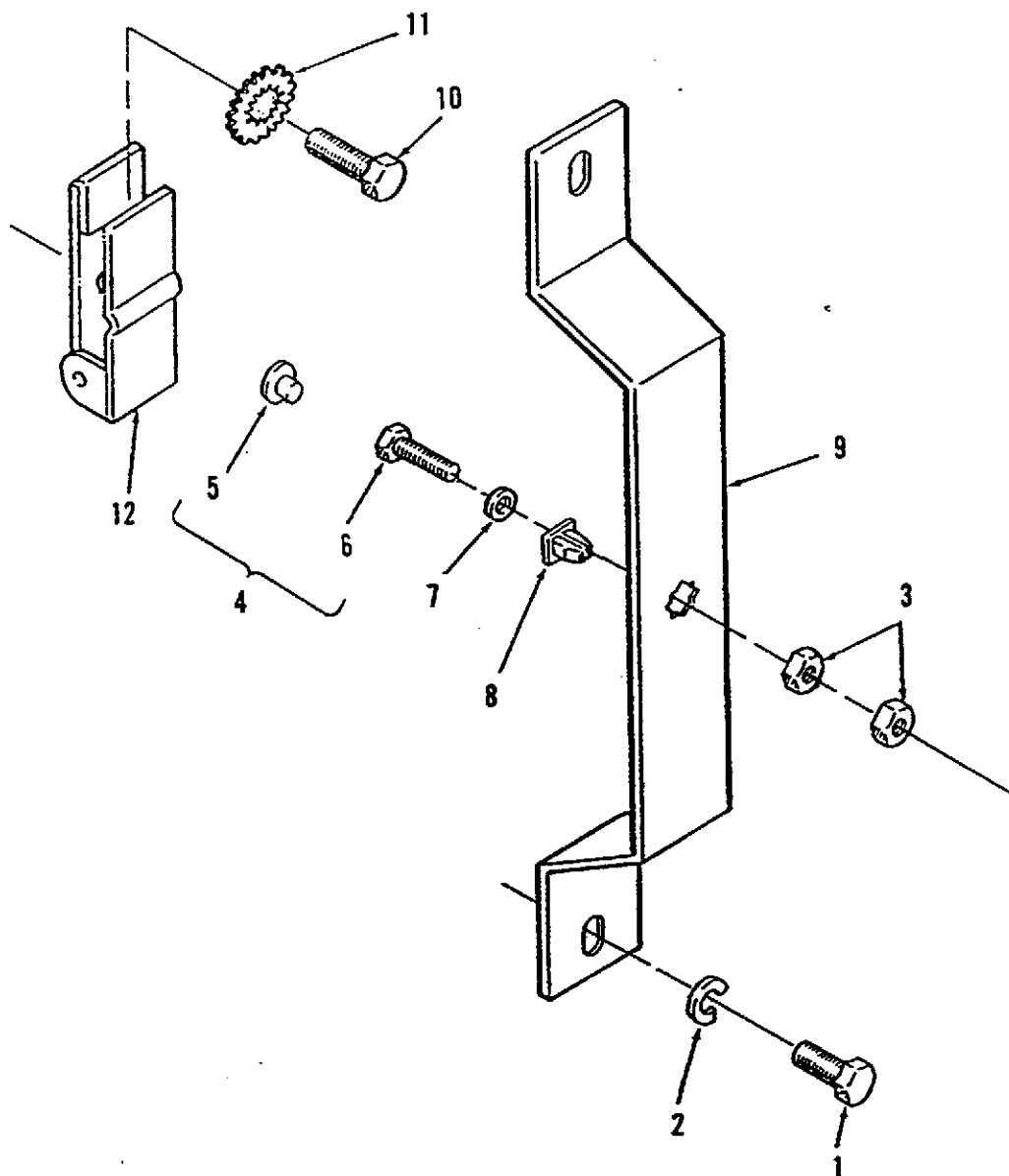
Bus Bar Assembly



Bus Bar Assembly

REF NO.	PART NO.	QTY USED	PART DESCRIPTION	REF NO.	PART NO.	QTY USED	PART DESCRIPTION
1	800-0050	4	Screw, Cap - Hex Head (3/8-16 x 1")	18	232-2583	1	Spacer, Bus Bar
2	800-0051	4	Screw, Cap - Hex Head (3/8-16 x 1-1/4")	19	332-1152	12	Terminal, Lug
3	800-0056	8	Screw, Cap - Hex Head (3/8-16 x 2-1/2")	20	232-2241	11	Bar, Bus
4	850-0050	16	Washer, Lock - Spring (3/8")	21	232-2343	3	Bar, Bus
5	862-0003	16	Nut, Hex (3/8-16)	22	232-2240	4	Bar, Bus
6	526-0029	16	Washer, Flat (3/8")	23	232-2238	1	Bar, Bus
7	800-0028	4	Screw, Cap - Hex Head (5/16-18 x 1")	24	232-2249	2	Bracket, Mounting - Bus Bar
8	114-0022	24	Screw, Cap - Hex Head (5/16-18 x 1-3/4")	25	232-2242	2	Board, Insulator - Center
9	800-0033	8	Screw, Cap - Hex Head (5/16-18 x 2")	26	232-2243	2	Board, Insulator - Front and Rear
10	850-0045	36	Washer, Lock - Spring (5/16")	27	800-0007	4	Screw, Cap - Hex Head (1/4-20 x 1")
11	526-0115	48	Washer, Flat (5/16")	28	862-0001	4	Nut, Hex (1/4-20)
12	232-2344	32	Spacer, Sleeve	29	850-0040	4	Washer, Lock - Spring (1/4")
13	862-0015	50	Nut, Hex (5/16-18)	30	526-0018	4	Washer, Flat (1/4")
14	520-0142	14	Stud (5/16-18 x 1-1/4"LG)	31	232-2387	4	Bracket, Angle
15	232-2246	2	Bar, Reconnection - Long	32	800-0051	3	Screw, Cap - Hex Head (3/8-16 x 1-1/4")
16	232-2248	2	Bar, Reconnection - Short	33	862-0003	3	Nut, Hex (3/8-16)
17	232-2582	1	Jumper, Bus Bar	34	850-0050	3	Washer, Lock - Spring (3/8")
				35	526-0029	3	Washer, Flat (3/8")
				36	232-2245	1	Board, Insulator
				37	232-2237	1	Bracket, Support

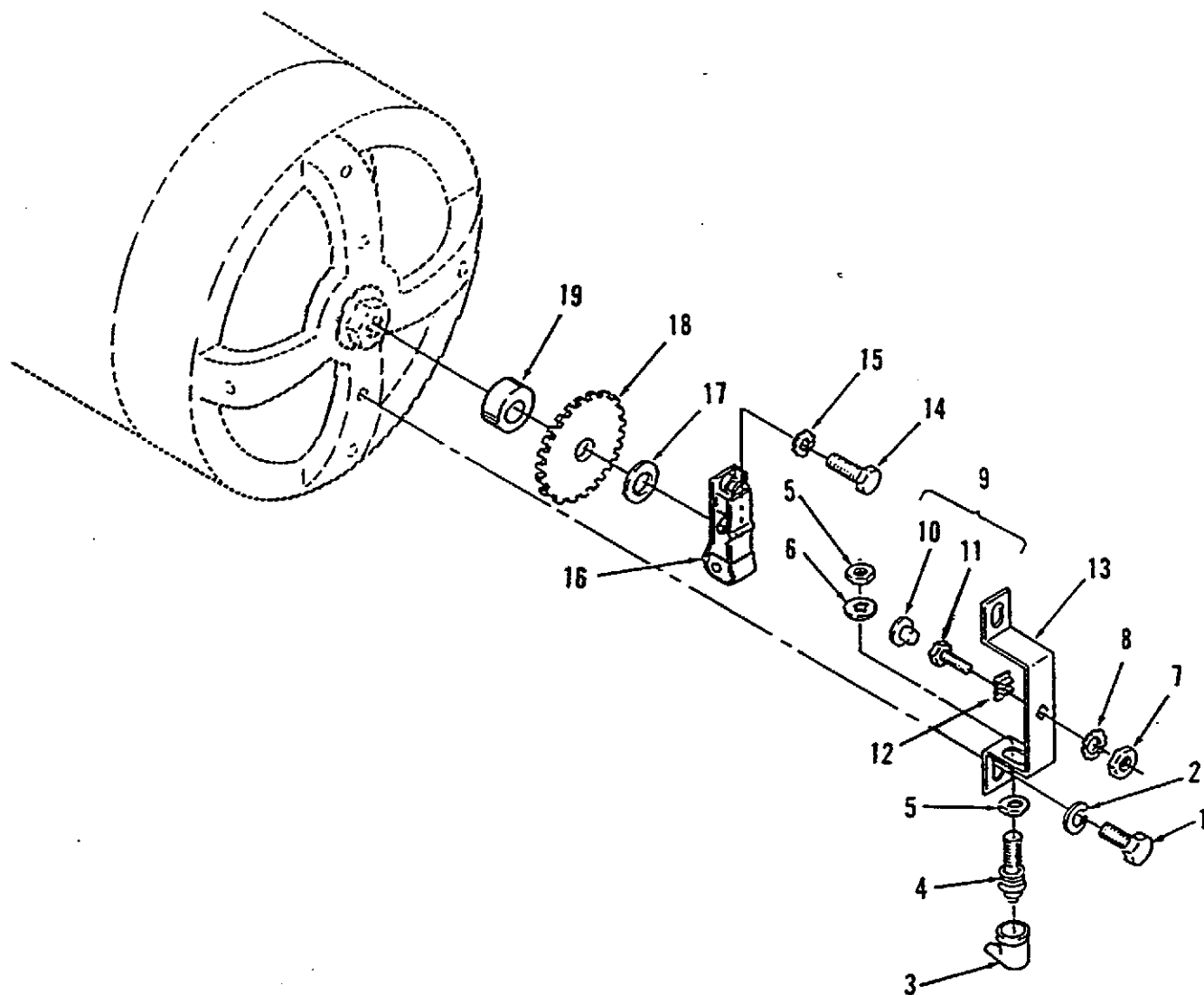
Overspeed Switch Assembly Begin Spec M



REF NO.	PART NO.	QTY USED	PART DESCRIPTION
1	800-0003	2	Screw, Cap - Hex Head (1/4-20 x 1/2")
2	850-0040	2	Washer, Lock - Spring (1/4")
3	862-0001	2	Nut, Hex (1/4-20)
4	150-0723	1	Point Assembly, Overspeed (Includes Contact and Modified Screw)
5	306-0036	1	Contact, Electrical

REF NO.	PART NO.	QTY USED	PART DESCRIPTION
6	150-0724	1	Screw, Cap - Modified
7	853-0013	1	Washer, Lock - ET (1/4")
8	870-0250	1	Nut, Insulating (1/4")
9	150-2104	1	Bracket, Mounting
10	800-0048	1	Screw, Cap - Hex Head (3/8-16 x 3/4")
11	856-0010	1	Washer, Lock - EIT (3/8")
12	150-0717	1	Switch, Overspeed

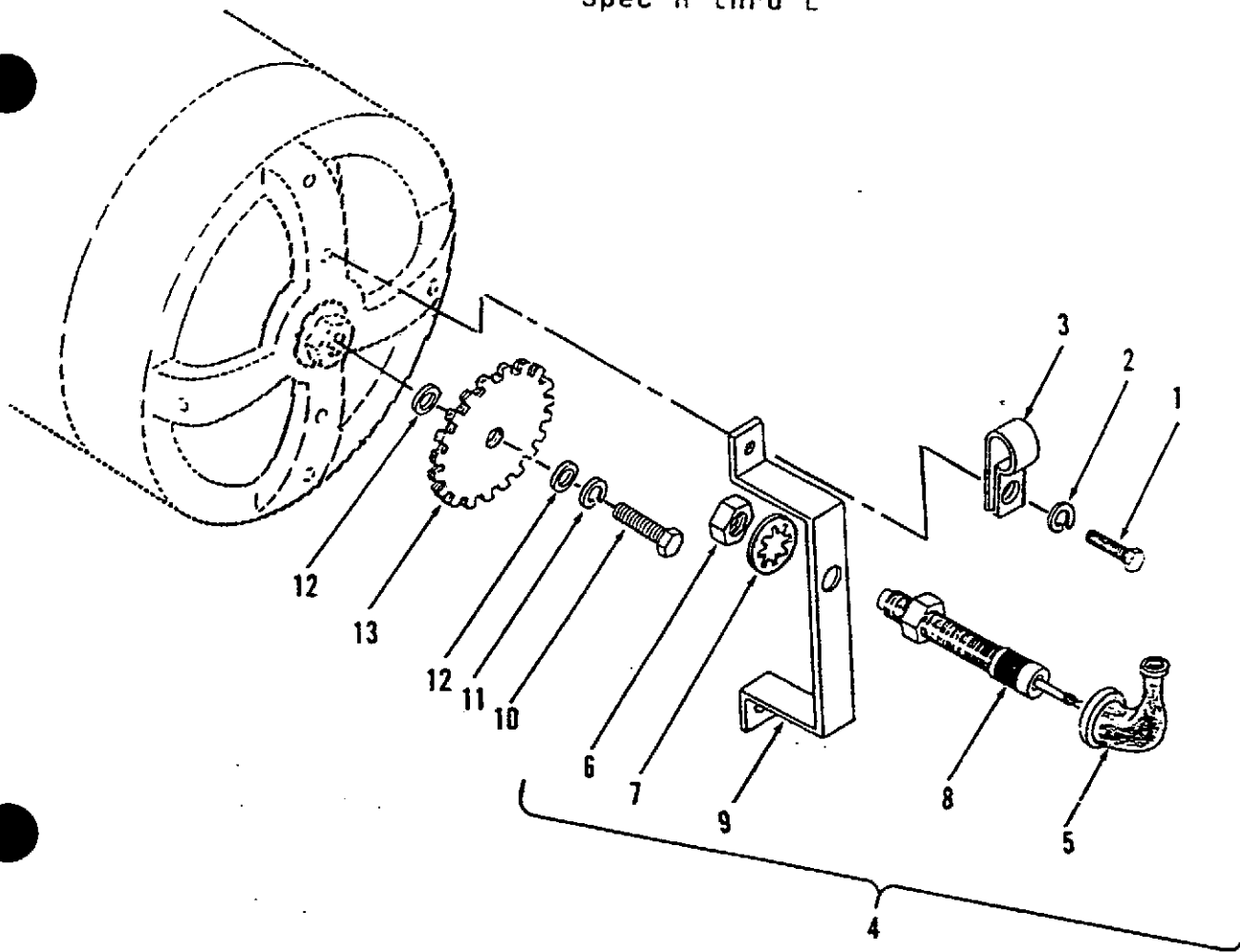
Magnetic Pickup
Begin Spec M



REF NO.	PART NO.	QTY USED	PART DESCRIPTION
1	800-0003	2	Screw, Cap - Hex Head (1/4-20 x 1/2")
2	850-0040	2	Washer, Lock - Spring (1/4")
3	150-1410	1	Cap, Insulating
4	150-1406	1	Pickup, Magnetic (Sensor)
5	868-0011	2	Nut, Hex (3/4-16)
6	854-0031	1	Washer, Lock - IT (3/4")
7	862-0001	2	Nut, Hex (1/4-20)
8	853-0013	1	Washer, Lock - ET (1/4")
9	150-0723	1	Point Assembly, Overspeed (Includes Contact and Modified Screw)

REF NO.	PART NO.	QTY USED	PART DESCRIPTION
10	306-0036	1	Contact, Electrical
11	150-0724	1	Screw, Cap - Modified
12	870-0250	1	Nut, Insulating (1/4")
13	301-9697	1	Bracket, Mounting
14	800-0053	1	Screw, Cap - Hex Head (3/8-16 x 1-3/4")
15	856-0010	1	Washer, Lock - EIT (3/8")
16	150-0717	1	Switch, Overspeed
17	526-0077	1	Washer, Flat (13/32" ID 1-1/4" OD x 1/4" Thick)
18	150-1557	1	Wheel, Sensor - Overspeed
19	370-4011	1	Spacer, Sleeve

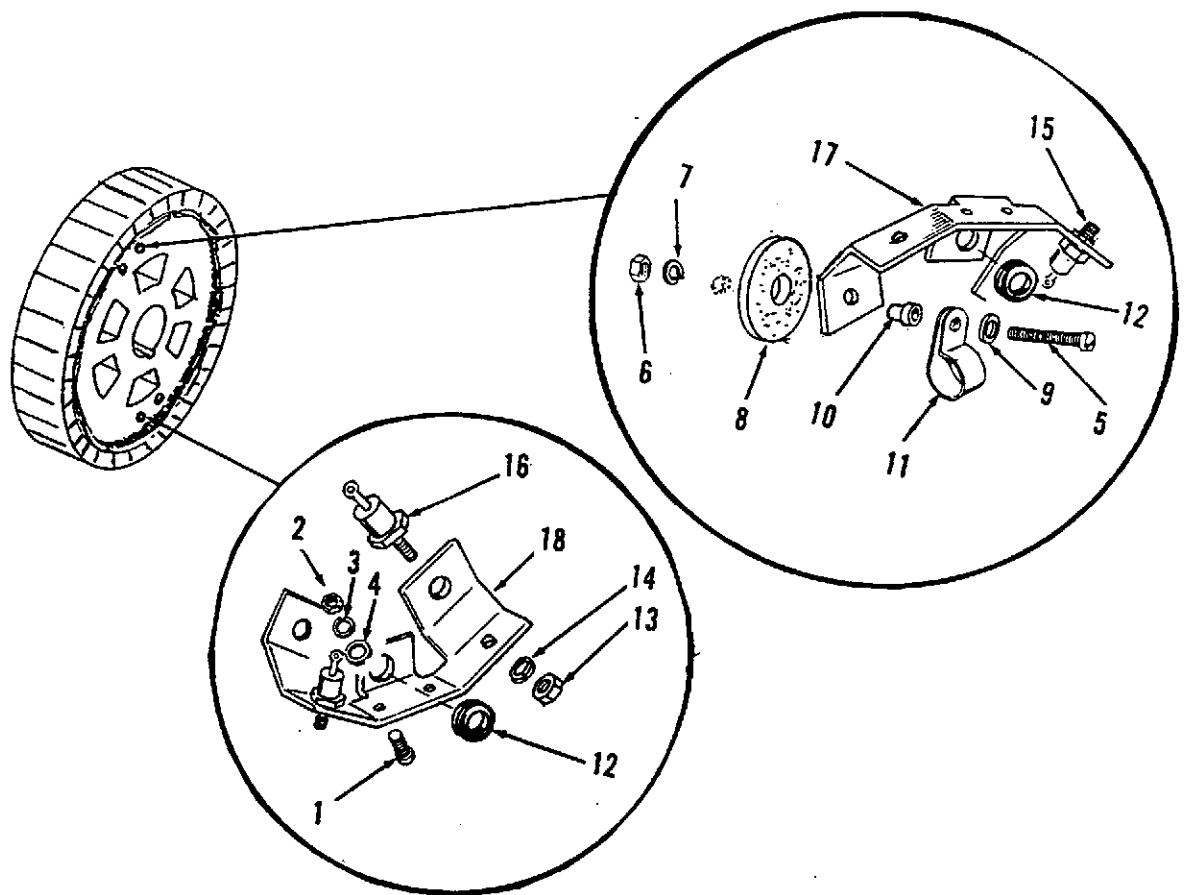
Overspeed Sensor Assembly
Spec H thru L



REF NO.	PART NO.	QTY USED	PART DESCRIPTION	REF NO.	PART NO.	QTY USED	PART DESCRIPTION
1	800-0005	2	Screw, Cap - Hex Head (1/4-20 x 1-1/2")	7	854-0031	1	Washer, Lock - IT (3/4")
2	850-0040	2	Washer, Lock - Spring (1/4")	8	150-1406	1	Pickup, Magnetic (Sensor)
3	332-1554	1	Clamp, Loop	9	150-1407	1	Bracket, Mounting
4	150-1411	1	Sensor Assembly, Overspeed (Includes Cap, Sensor and Mounting Bracket)	10	800-0092	1	*Screw, Cap - Hex Head (1/2-13 x 1-1/2")
5	150-1410	1	Cap, Insulating	11	850-0060	1	*Washer, Lock - Spring (1/2")
6	868-0011	2	Nut, Hex (3/4-16)	12	526-0252	2	*Washer, Flat (1/2")
				13	150-1405	1	*Wheel, Sensor - Overspeed

* - Parts included with Generator Rotor Assembly.

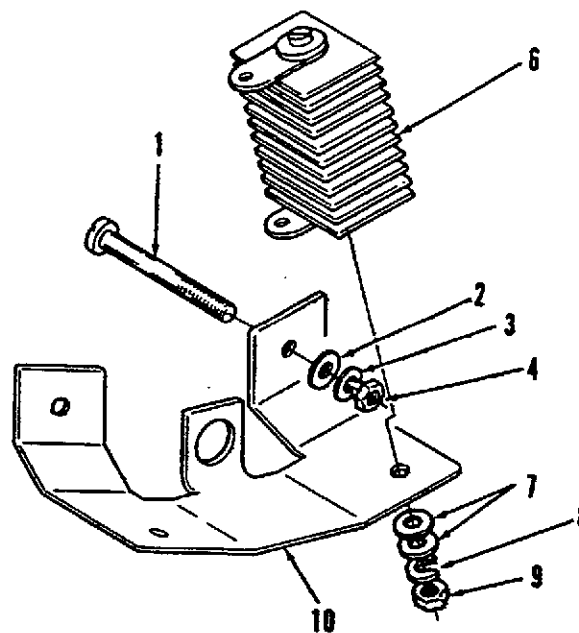
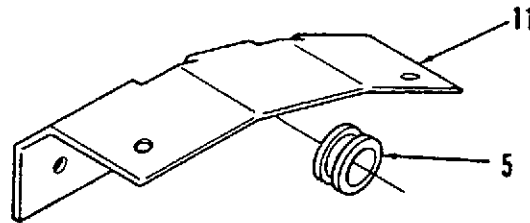
Exciter Rotor Components



G1092-1

REF NO.	PART NO.	QTY USED	PART DESCRIPTION	REF NO.	PART NO.	QTY USED	PART DESCRIPTION
	201-1902	1	Rotor, Exciter (Includes Heat Sinks and Diodes)	7	850-0030	4	Washer, Lock - Spring (#10)
	201-2453	1	Standard	8	508-0156	4	Washer, Insulating
1	813-0100	2	Environmental Protected	9	526-0009	4	Washer, Flat (#10)
		2	Screw, Machine - Round Head (#10-32 x 1/2")	10	508-0187	4	Spacer, Stepped
2	870-0053	2	Nut, Hex (#10-32)	11	332-0050	2	Clamp, Loop
3	850-0030	2	Washer, Lock - Spring (#10)	12	508-0093	2	Grommet
4	526-0008	2	Washer, Flat (#10)	13	868-0001	6	Nut, Hex (1/4-28)
5	813-0110	4	Screw, Machine - Round Head (#10-32 x 2")	14	850-0040	6	Washer, Lock - Spring (1/4")
6	870-0053	4	Nut, Hex (#10-32)	15	358-0011	3	Rectifier, Diode - Positive (CR1, CR2, CR3)
				16	358-0012	3	Rectifier, Diode - Negative (CR4, CR5, CR6)
				17	363-0049	1	Sink, Heat
				18	363-0050	1	Sink, Heat

Voltage Suppressor Components

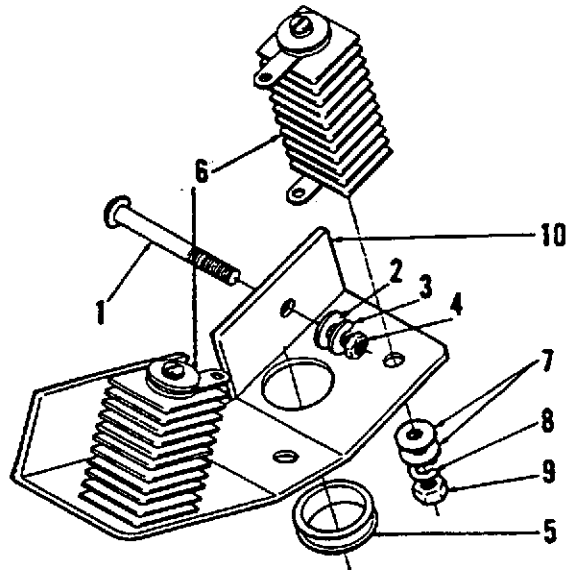
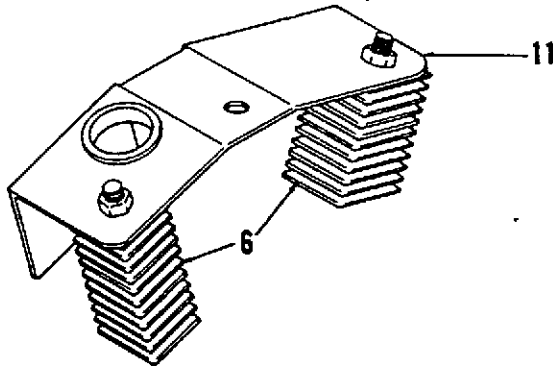


XES1229

REF NO.	PART NO.	QTY USED	PART DESCRIPTION
	232-2445	1	Suppressor, Voltage
1	813-0112	4	Screw, Machine - Round Head (#10-32 x 2-1/2")
2	526-0140	4	Washer, Flat (#10)
3	850-0030	4	Washer, Lock - Spring (#10)
4	870-0053	4	Nut, Hex (#10-32)
5	508-0093	2	Grommet

REF NO.	PART NO.	QTY USED	PART DESCRIPTION
6	305-0526	1	Set, Voltage Suppressor
7	526-0140	4	Washer, Flat (#10)
8	850-0030	4	Washer, Lock - Spring (#10)
9	870-0053	4	Nut, Hex (#10-32)
10	363-0054	1	Sink, Heat
11	363-0055	1	Sink, Heat

Dual Voltage Suppressor Components

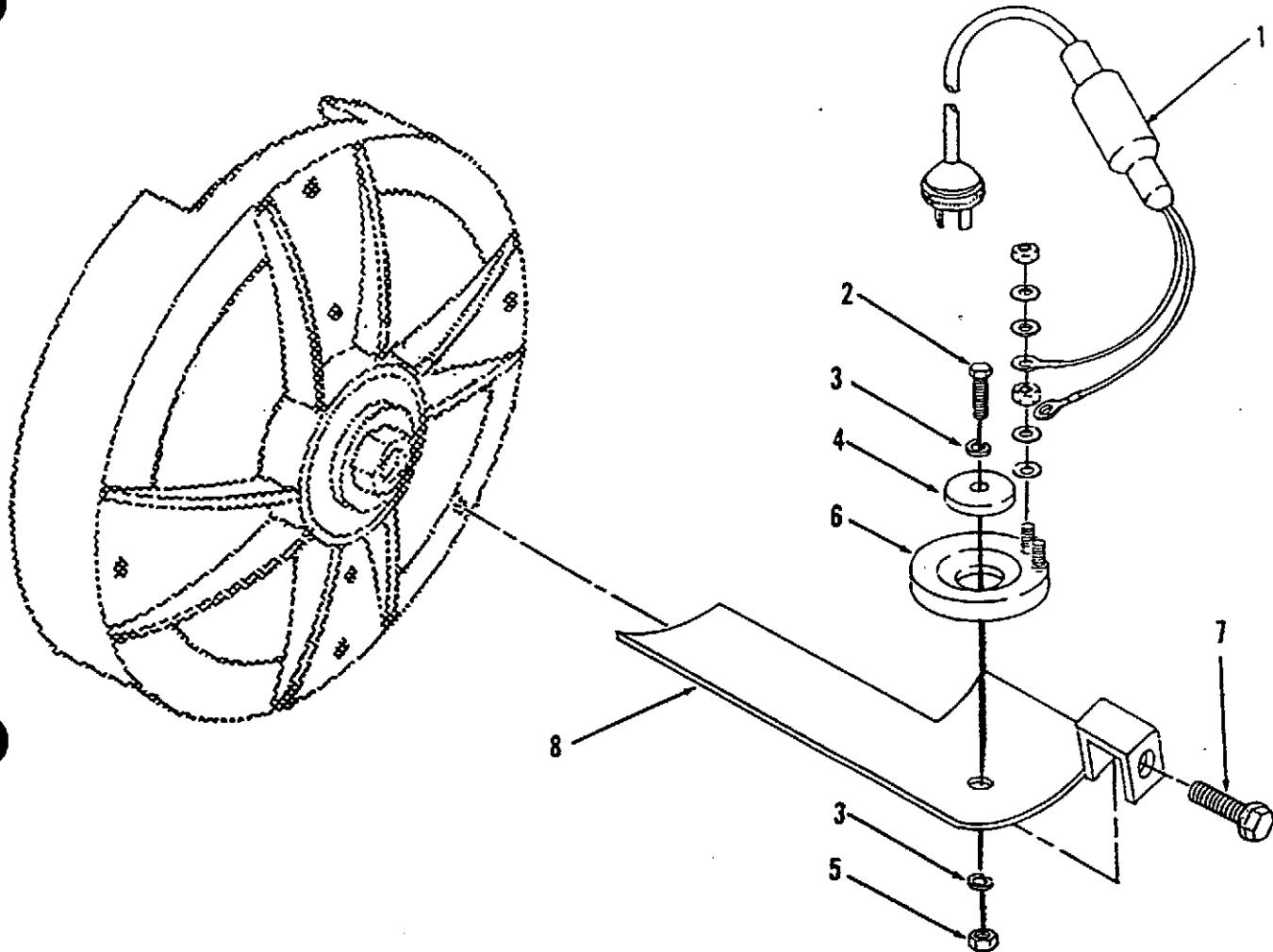


XES1230

REF NO.	PART NO.	QTY USED	PART DESCRIPTION
	232-2639	1	Suppressor, Voltage - Dual
1	813-0112	8	Screw, Machine - Round Head (#10-32 x 2-1/2")
2	526-0140	8	Washer, Flat (#10)
3	850-0030	8	Washer, Lock - Spring (#10)
4	870-0053	8	Nut, Hex (#10-32)
5	508-0093	2	Grommet

REF NO.	PART NO.	QTY USED	PART DESCRIPTION
6	305-0526	2	Set, Voltage Suppressor
7	526-0140	8	Washer, Flat (#10)
8	850-0030	8	Washer, Lock - Spring (#10)
9	870-0053	8	Nut, Hex (#10-32)
10	363-0025	1	Sink, Heat
11	363-0033	1	Sink, Heat

Generator Heater

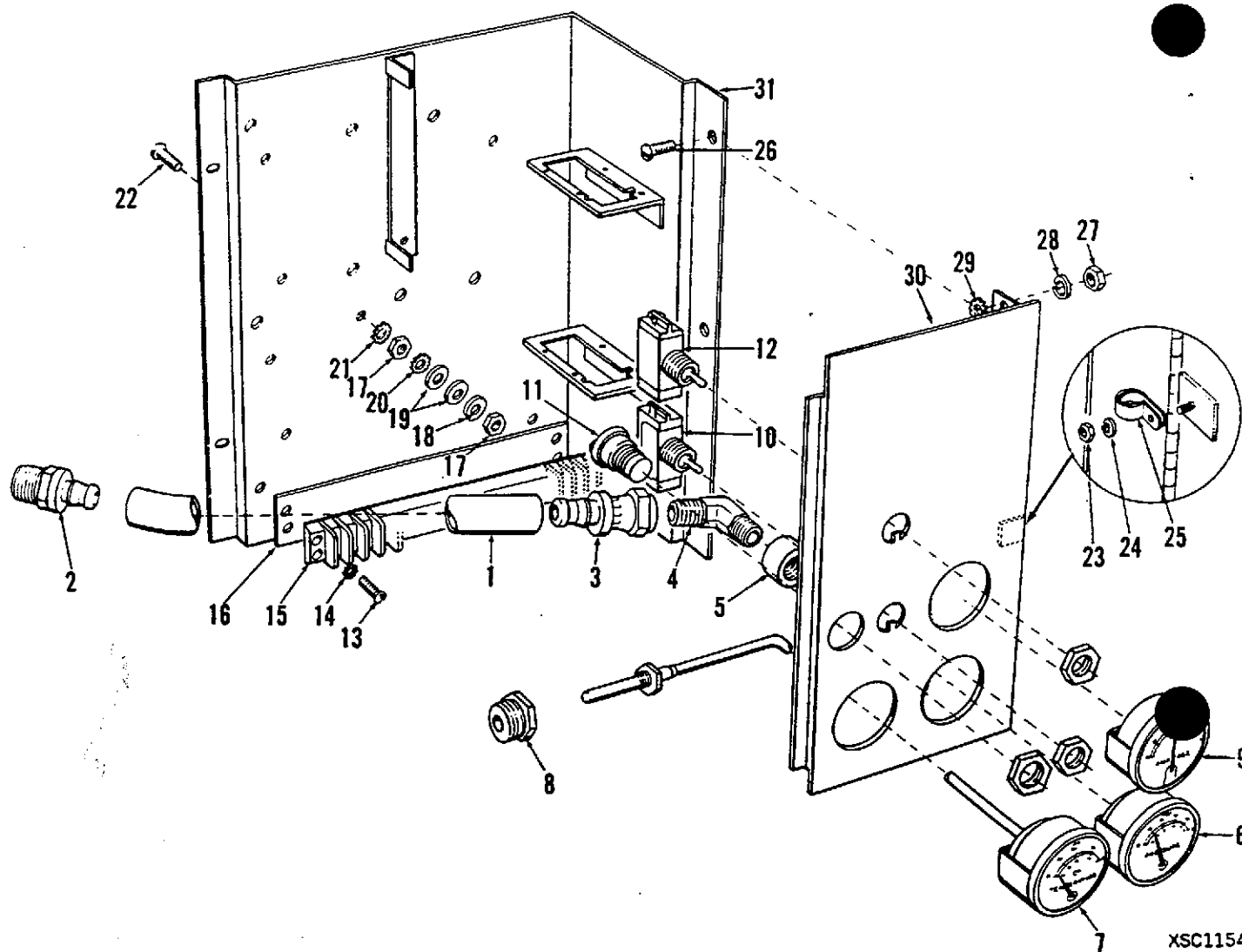


G1086-1

REF NO.	PART NO.	QTY USED	PART DESCRIPTION
1			Cable, Electrical (Includes Thermostat)
	335-0146	1	120 VAC
	335-0147	1	240 VAC
2	800-0004	1	Screw, Cap - Hex Head (1/4-20 x 5/8")
3	850-0038	1	Washer, Lock - Spring (1/4")
4	526-0158	1	Washer, Flat (17/64"ID x 1"OD x 1/8"Thick)

REF NO.	PART NO.	QTY USED	PART DESCRIPTION
5	862-0001	1	Nut, Hex (1/4-20)
6			Heater, Electrical
	333-0059	1	125 Watt, 120 VAC
	333-0192	1	200 Watt, 240 VAC
7	821-0014	1	Screw, Self-locking - Hex (5/16-18 x 1/2")
8			Bracket, Mounting
	232-2446	1	Used with 120 VAC Heater
	232-2832	1	Used with 240 VAC Heater

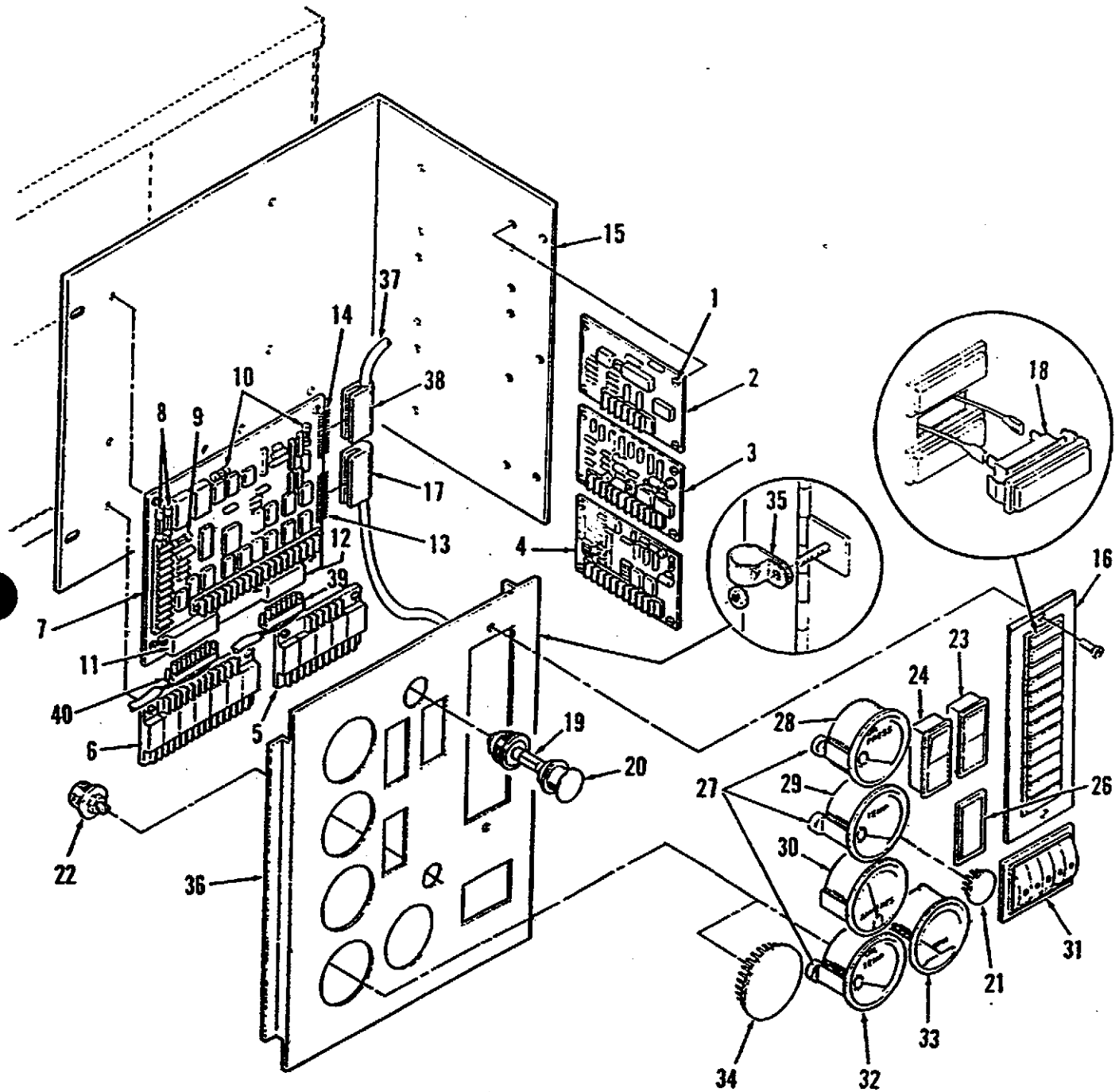
Engine Control Mechanical Gauges



REF NO.	PART NO.	QTY USED	PART DESCRIPTION	REF NO.	PART NO.	QTY USED	PART DESCRIPTION
1	503-1077	1	Hose	14	853-0003	2	Washer, Lock - ET (#6)
2	502-0444	1	Adapter, Pipe to Hose - Male	15	332-0795	1	Block, Terminal - 20 Place
3	502-0445	1	Adapter, Pipe to Hose - Female	16	332-1241	1	Strip, Marker
4	502-0583	1	Elbow, Pipe - 45 Degree	17	871-0010	2	Nut, Hex - Brass (#10-32)
5	502-0051	1	Coupling, Pipe	18	850-0030	2	Washer, Lock - Spring (#10)
6	193-0232	1	Gauge, Pressure - Oil	19	526-0062	2	Washer, Flat - Brass (#10)
	193-0233	1	0 - 75 Pounds	20	853-0008	1	Washer, Lock - ET (#10)
7		1	Gauge, Temperature - Water	21	856-0003	1	Washer, Lock - EIT (#10)
			(Includes Reducer)	22	815-0203	1	Screw, Machine - Round Head (#10-32 x 7/8")
	193-0234	1	72" Capillary Tube	23	870-0053	1	Nut, Hex (#10-32)
	193-0235	1	84" Capillary Tube	24	850-0030	1	Washer, Lock - Spring (#10)
	193-0236	1	96" Capillary Tube	25	332-0051	2	Clamp, Loop
	193-0305	1	144" Capillary Tube	26	815-0026	5	Screw, Machine - Truss Head (#10-32 x 3/8")
8	NFS	1	Reducer, Hex (Part of Gauge)	27	870-0053	1	Nut, Hex (#10-32)
9	302-0061	1	Ammeter	28	850-0030	1	Washer, Lock - Spring (#10)
10	308-0088	1	Switch, Toggle	29	856-0003	1	Washer, Lock - EIT (#10)
11	308-0297	1	Switch, Push	30	301-4009	1	Panel, Control
12	308-0155	1	Switch, Toggle	31	301-3253	1	Bracket, Mounting
13	812-0066	2	Screw, Machine - Round Head (#6-32 x 3/4")				

XSC1154

Engine Control
Begin Spec M



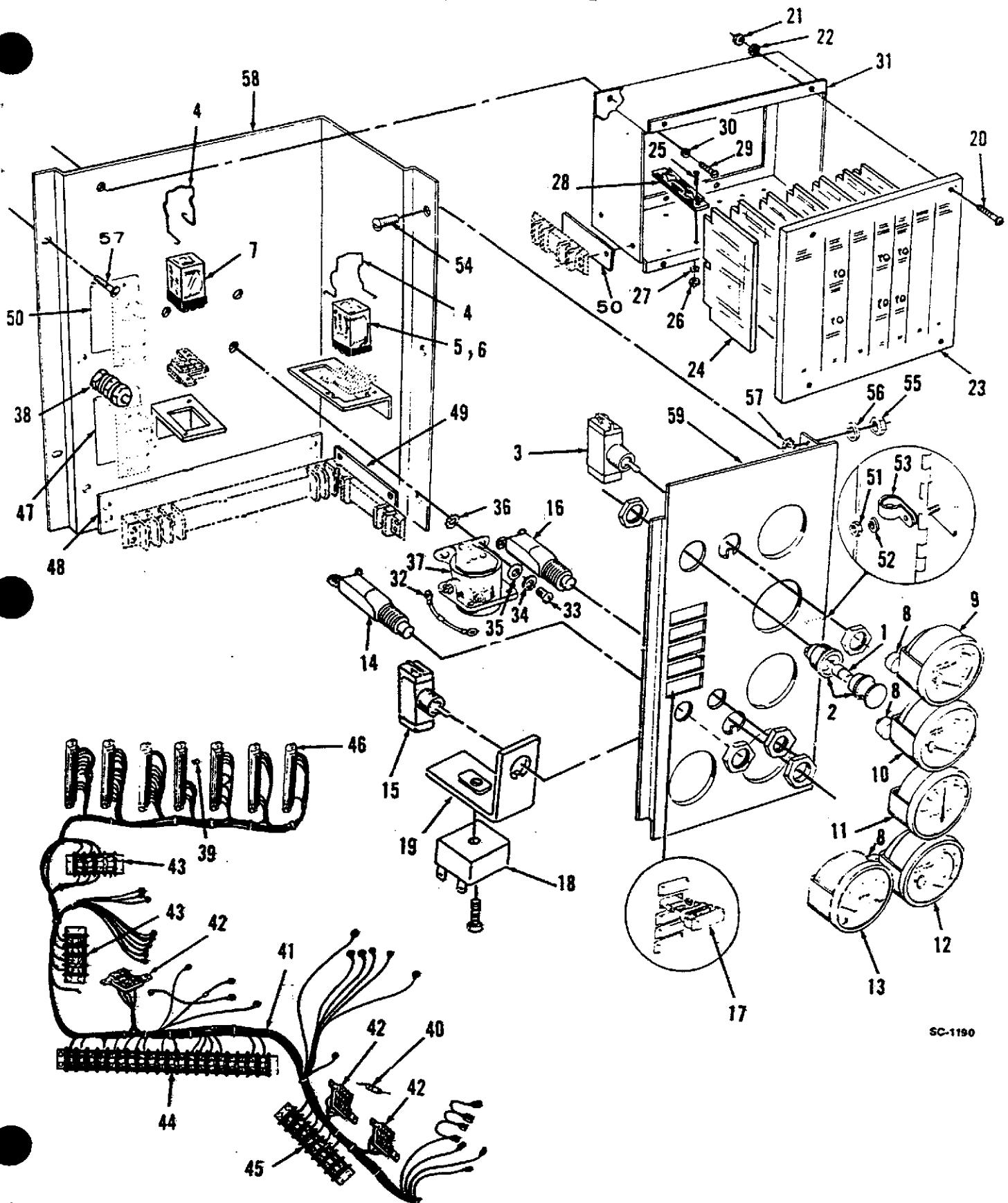
59C

Engine Control **Begin Spec M**

REF NO.	PART NO.	QTY USED	PART DESCRIPTION	REF NO.	PART NO.	QTY USED	PART DESCRIPTION
1	815-0544	24	Screw, Machine - Round Head With IT Lock Washer (#6-32 x 1/2")	17	323-1310	1	Housing, 13 Pin (J3)
2	300-2900	1	Board, Time Delay, Start/Stop - 24 VDC (A15)	18	323-1302	13	Contact, Pin
3			Board, Magnetic Sensor, Start Disconnect/Over Speed Sensor (A16)	19	322-0369-02	1	Lamp, Incandescent - 1/3 Watt, 28 VDC
	300-2903	1	Standard	20	322-0017	1	Lamp, Incandescent - 28 VDC (DS11)
	300-2904	1	Precision	21	322-0361	1	Holder, Lamp
4	300-2906	1	Board, Over-Under Voltage Sensor - 24 VDC (A17)	22	517-0131	1	Plug, Button
5	300-2856	1	Board, Relay - 24 VDC (A13)	23	151-0402	1	Potentiometer (R11)
6	300-2863	1	Board, Relay - 24 VDC (A14)	24	308-0785	1	Switch, Push (S11)
7			Board, Engine Monitor (A11) (Includes Fuses and Connectors)	26	308-0784	1	Switch, Push (S12)
	300-2808	1	24 VDC, 2 Light	27	301-6257	1	Cover
	300-2812	1	24 VDC, 12 Light	28	193-0250	3	Resistor, Gauge (R12)
8	321-0270	2	Fuse, Cartridge - 20 Amp (F1, F2)	29	193-0352	1	Gauge, Pressure - Oil (M11)
9	321-0231	1	Fuse, Cartridge - 15 Amp (F3)	29	193-0351	1	Gauge, Temperature - Water (M12)
10	321-0094	2	Fuse, Cartridge - 5 Amp (F4, F5)	30	302-1790	1	Ammeter (M13)
11	323-1305	1	Connector, 8 Pin (P1)	31	302-0885	1	Meter, Totalizing - Time (M14)
12	323-1303	1	Connector, 6 Pin (P2)	32	193-0330	1	Gauge, Temperature - Oil (M15)
13	323-1309	1	Connector, 13 Pin (P3)	33	302-1715	1	Tachometer (M16)
14	323-1307	1	Connector, 12 Pin (P4)	34	517-0221	1	Plug, Button
15	301-8851	1	Bracket, Mounting	35	322-0052	1	Clamp, Loop
	821-0004	4	Screw, Self-locking - Hex (#10-32 x 5/16")		870-0131	1	Nut, Self-locking - Hex (#10-32)
16			Module, Indicator - Fault (A12) (Includes Connector)	36			Door, Control
	322-0358-02	1	24 VDC, 2 Light		301-9055-01	1	5 Meter Holes
	322-0360-02	1	24 VDC, 12 Light		301-9055-02	1	3 Meter Holes
	815-0385	2	Screw, Machine - Round Head (#6-32 x 1/2")	37	338-1817	1	Harness, Wiring - DC (Includes Connector)
	870-0183	2	Nut, Self-locking - Hex (#6-32)	38	323-1308	1	Housing, 12 Pin (J4)
					323-1302	12	Contact, Pin
				39	323-1304	1	*Housing, 6 Pin
					323-1200	6	*Contact, Pin
				40	323-1306	1	*Housing, 8 Pin
					323-1200	8	*Contact, Pin

* - Parts Included in Engine Wiring Harness

Engine Control
Spec H thru L



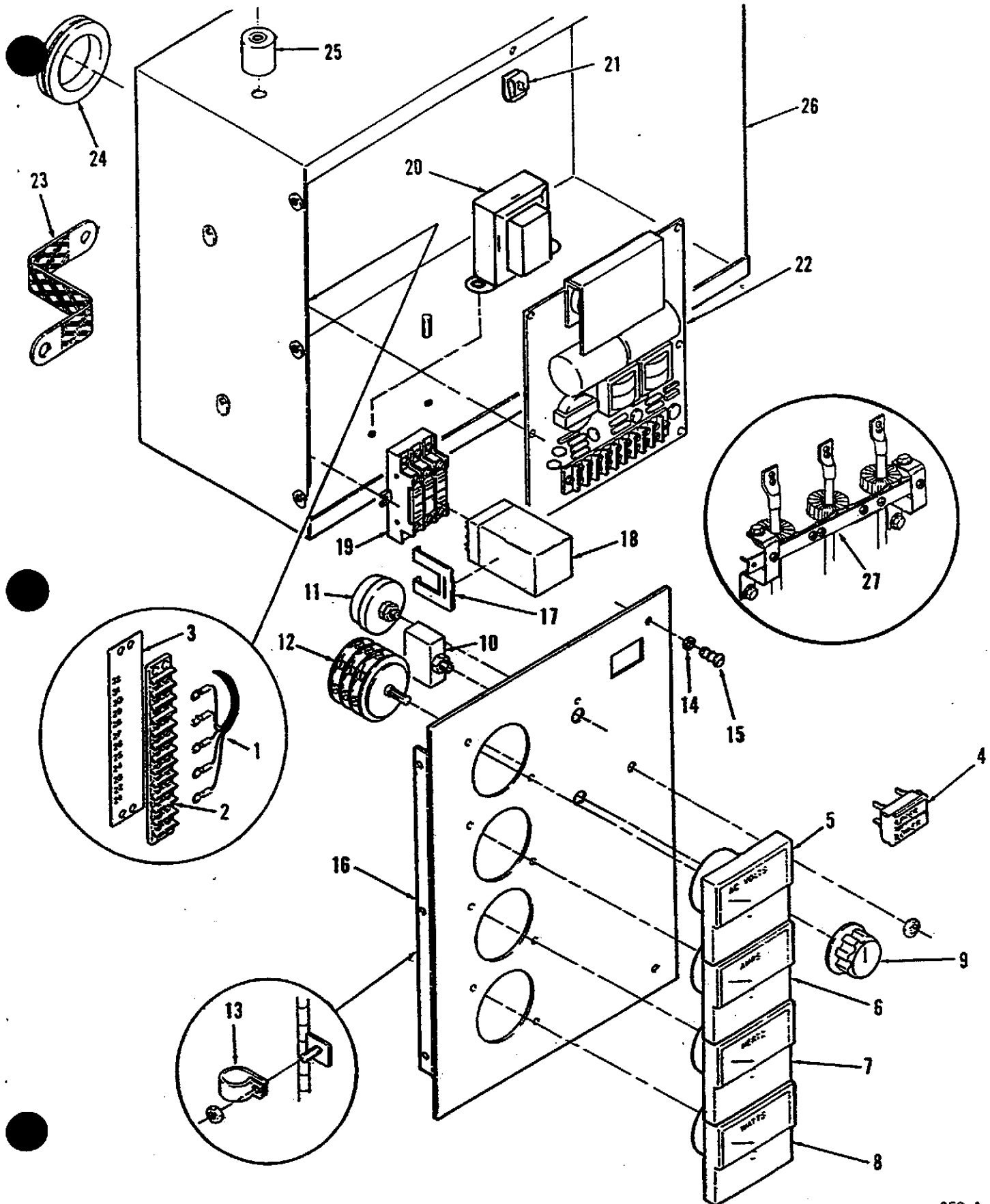
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Engine Control Spec H Thru L

REF NO.	PART NO.	QTY USED	PART DESCRIPTION	REF NO.	PART NO.	QTY USED	PART DESCRIPTION
1	322-0017	1	Lamp, 24 VDC (DS11)	26	860-0006	28	Nut, Hex (#6-32)
2	322-0149	1	Light, Panel	27	853-0003	28	Washer, Lock - ET (#6)
3	308-0002	1	Switch, Toggle (S11)	28	323-0814	14	Guide
4	307-1157	3	Spring, Holddown - Relay	29	813-0100	4	Screw, Machine - Round Head (#10-32 x 1/2")
5	307-1056	1	Relay, Ignition (K12)	30	850-0030	4	Washer, Lock - Spring (#10)
6	307-1056	1	Relay, Start Disconnect (K11)	31	301-3588	1	Rack
7	307-1061	1	Relay, Start Protection (K14)	32	357-0018	1	Diode with Terminals
8	193-0250	3	Resistor, Gauge (R11,R12,R13)	33	813-0098	2	Screw, Machine - Round Head (#10-32 x 3/8")
9			Gauge, Pressure - Oil, 12 VDC (M11)	34	850-0030	2	Washer, Lock - Spring (#10)
	193-0243	1	Begin 1977	35	526-0009	2	Washer, Flat (#10)
	193-0107	1	Thru 1976	36	856-0003	2	Washer, Lock - EIT (#10)
10			Gauge, Temperature - Water - 12 VDC (M12)	37	307-0061	1	Relay, Starting - 24 VDC (K13)
	193-0245	1	Begin 1977	38			Terminal, Ground (Includes Parts Marked *)
	193-0106	1	Thru 1976		871-0010	2	*Nut, Hex (#10-32)
11	302-1362	1	Ammeter (M13)		850-0030	1	*Washer, Lock - Spring (#10)
12			Gauge, Temperature - Oil - 12 VDC (M14)		526-0062	2	*Washer, Flat (#10)
	193-0248	1	Begin 1977		853-0008	1	*Washer, Lock - ET (#10)
	193-0187	1	Thru 1976		856-0003	1	*Washer, Lock - EIT (#10)
13	302-0749	1	Tachometer (M15)		815-0203	1	*Screw, Machine - Round Head (#10-32 x 7/8")
14	308-0337	1	Switch, Push - Lamp Test (S13)	39	332-1276	7	Plug, Keying
15			Switch, Toggle - Selector (S12)	40	357-0004	2	Diode (CR11, CR12)
	308-0220	1	Standard	41			@Harness, Wiring
	308-0347	1	Penn State		338-0715	1	Set with Single Fault Light
	308-0539	1	Alarm Control		338-0705	1	Set with Five Fault Lights
16	308-0091	1	Switch, Push - Alarm Reset (S14)	42	323-0765	3	Socket, Relay (Less Terminals)
17			Light, Indicator - 28 VDC		332-1280	11	Terminal
	322-0119	1	Overcrank (DS12)	43	332-0537	2	Block, Terminal (TB12,14)
	322-0120	1	Low Oil Pressure (DS14)	44	332-1005	1	Block, Terminal (TB11)
	322-0121	1	High Engine Temperature (DS15)	45	332-0699	1	Block, Terminal (TB13)
	322-0122	1	Low Engine Temperature (DS16)	46	332-1271	7	Connector
	322-0123	1	Overspeed (DS13)	47	332-1561	1	Strip, Marker
	322-0129	1	Fault (DS12)	48	332-1239	1	Strip, Marker
	322-0315	1	Switch Off (DS17)	49	332-1559	1	Strip, Marker
	322-0137	1	Blank, No Legend	50	332-1560	1	Strip, Marker
18	333-0194-02	1	Flasher, 24 VDC	51	870-0053	1	Nut, Hex (#10-32)
	813-0105	1	Screw, Machine - Round Head (#10-32 x 1")	52	850-0030	1	Washer, Lock - Spring (#10)
19	301-6053	1	Bracket, Mounting - Flasher	53	332-0051	1	Clamp, Loop
20	812-0063	4	Screw, Machine - Round Head (#6-32 x 1/2")	54	815-0026	5	Screw, Machine - Truss Head (#10-32 x 3/8")
21	860-0006	4	Nut, Hex (#6-32)	55	870-0053	1	Nut, Hex (#10-32)
22	853-0003	4	Washer, Lock - ET (#6)	56	850-0030	1	Washer, Lock - Spring (#10)
23	301-3635	1	Cover	57	856-0003	1	Washer, Lock - ET (#10)
24			Control	58	301-3621	1	Bracket, Mounting
	300-0953	1	Board, Engine Monitor (A12)	59			Panel, Control
	300-0954	1	Board, Engine Shutdown (A11)		301-3661	1	Single Fault Light Control
	300-0955	1	Board, Remote Indicator (A13)		301-3978	1	3 Meters, 1 Panel Light
	300-0956	1	Board, Cyle Cranker (A14)		301-3979	1	4 Meters, 1 Panel Light
	300-0957	1	Board, Overspeed Sensor (A16)				5 Meters, 1 Panel Light
	300-0958	1	Board, Start Disconnet (A17)				Five Fault Light Control
	300-0973	1	Board, StartStop (A15)		301-3629	1	3 Meters, 1 Panel Light
	300-0977	1	Board, Standard Cranker (A14)		301-3976	1	4 Meters, 1 Panel Light
	300-0987	1	Board, Bypass (A15)		301-3977	1	5 Meters, 1 Panel Light
25	812-0063	28	Screw, Machine - Round Head (#6-32 x 1/2")		301-7079	1	Six Fault Light Control
							3 Meters, 1 Panel Light

@ - Standard Harness Listed; Sets with 4 or 5 Meters and other special features may require additional electrical leads.
* - Parts Included in Ground Terminal.

Generator Control Begin Spec M

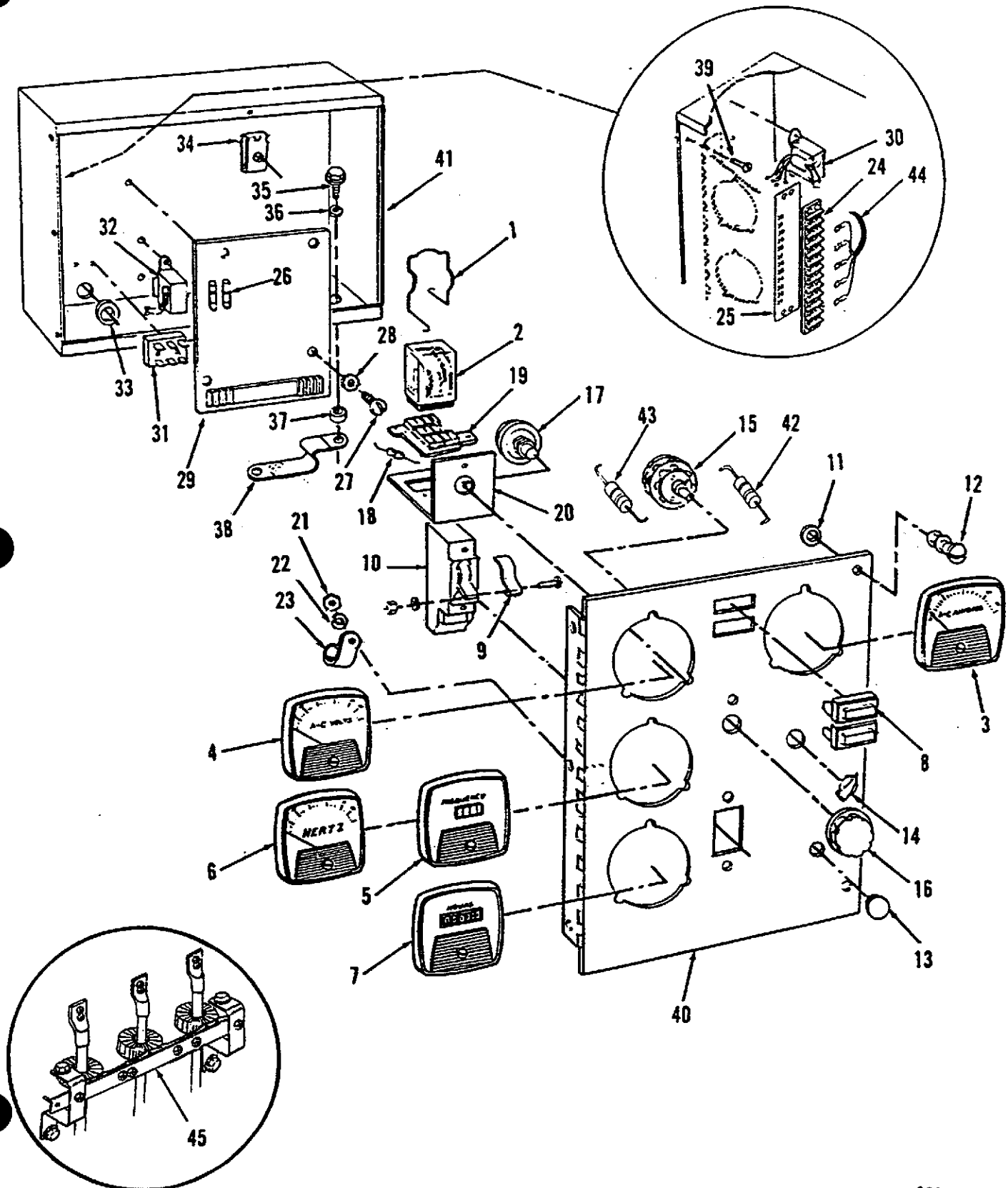


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Generator Control Begin Spec M

REF NO.	PART NO.	QTY USED	PART DESCRIPTION	REF NO.	PART NO.	QTY USED	PART DESCRIPTION
1			Harness, Wiring - (Includes Terminal Block)	17	307-1987	2	Clip, Relay
	338-1818	1	Control with Meters	18	307-1056	1	Relay, 24 VDC (K21)
	338-1853	1	Control without Meters	19	323-0804	1	Socket, Relay
	812-0065	2	Screw, Machine - Round Head (#6-32 x 5/8")		815-0544	2	Screw, Machine - Round Head with IT Lock Washer (#6-32 x 1/2")
2	332-0607	1	Block, Terminal (TB1)	20	315-0642	1	Transformer, Step-down Code 9 Only (T21)
3	332-2723	1	Strip, Marker		812-0077	2	Screw, Machine - Round Head (#8-32 x 3/8")
4	322-0363	1	Light, Indicator - Dual (DS21, DS22)		856-0002	2	Washer, Lock - EIT (#8)
5			Voltmeter (M21)		406-0332	2	Receptacle, Fastener
	302-1148	1	0-300/600 VAC, Code 17, 517	21	300-2880	1	Regulator, Voltage (VR21)
	302-1753	1	0-750 VAC, Code 9	22	815-0544	6	Screw, Machine - Round Head with IT Lock Washer (#6-32 x 1/2")
6			Ammeter (M22)	23	337-0049	1	Strap, Electrical
	302-1686	1	0-300 Amp, Code 9		800-0024	1	Screw, Cap - Hex Head (5/16-18 x 1/2")
	302-1726	1	0-400/800 Amp, Code 17, 517		856-0008	1	Washer, Lock - EIT (5/16")
7	302-1720	1	Meter, Frequency (M23)	24	508-0051	1	Grommet
8		1	Wattmeter (M24) (See Separate page for Components)	25	402-0527	2	Mount, Vibration
9	303-0032	1	Knob		800-0045	4	Screw, Cap - Hex Head (5/16-18 x 3/8")
10			Breaker, Circuit (CB21)		850-0045	4	Washer, Lock - Spring (5/16")
	320-1121	1	Standard	26	301-8065	1	Box, Control
	320-1438	1	With Aux Contact	27		1	Current Transformer (See Separate Page for Components)
11	303-0261	1	Rheostat (R21)				
12	308-0284	1	Switch, Rotary (S21)				
13	332-0052	1	Clamp, Loop				
	870-0131	1	Nut, Self-locking - Hex with ET Lock Washer (#10-32)				
14	406-0334	2	Clip, Fastener				
15	406-0333	2	Stud, Fastener				
16			Door, Control				
	301-9054-01	1	4 Meter Holes				
	301-9054-02	1	3 Meter Holes				
	301-9054-03	1	No Meter Holes				
	821-0004	3	Screw, Self-locking - Hex (#10-32 x 5/16")				

Generator Control
Spec H thru L

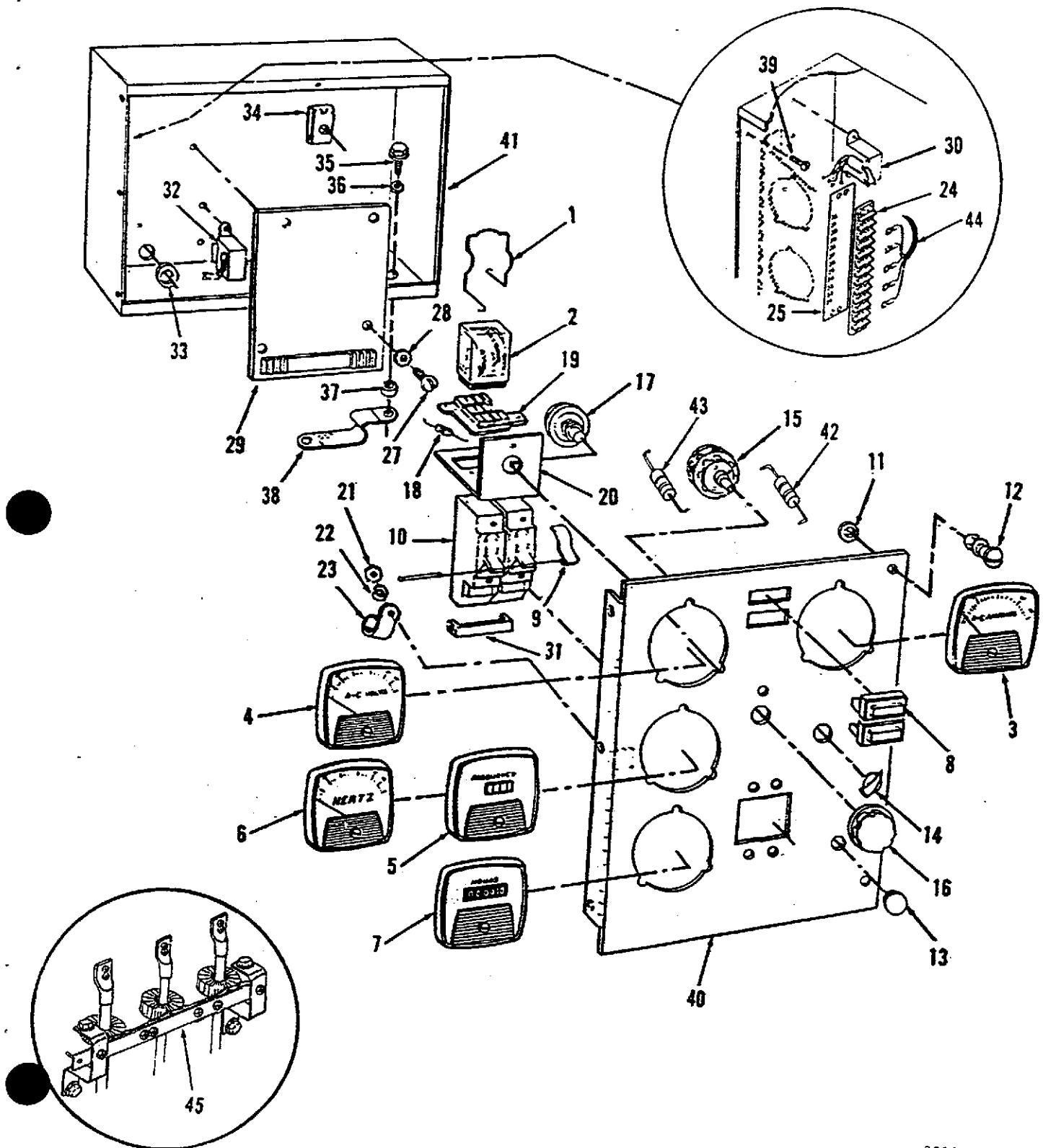


SC1164-1

Generator Control
Spec H thru L

REF NO.	PART NO.	QTY USED	PART DESCRIPTION	REF NO.	PART NO.	QTY USED	PART DESCRIPTION
1	307-1157	1	Spring, Relay	24			Block, Terminal (TB21)
2	307-1061	1	Relay (K21)	332-0607	1	12 Place	
3			Ammeter (M21)	332-0795	1	16 Place	
	302-0413	1	0-300 Amp, Code 9 - 200kW Set	812-0066	2	Screw, Machine - Round Head	
	302-0605	1	0-400 Amp, Code 6			(#6-32 x 3/4")	
	302-0605	1	0-400 Amp, Code 9 - 230kW Set	853-0003	2	Washer, Lock - ET (#6)	
	302-0414	1	0-500 Amp, Code 5, 7	850-0020	2	Washer, Lock - Spring (#6)	
	302-0877	1	0-400/800 Amp, Code 517	25		Strip, Marker	
	302-0878	1	0-500/1000 Amp, Code 17	332-1242	1	16 Place	
4			Voltmeter (M22)	332-1248	1	12 Place	
	302-0421	1	0-300 VAC, Code 5	26	321-0204	2	Fuse, Cartridge - 1/4 Amp
	302-0612	1	0-500 VAC, Code 7	27	812-0065	4	Screw, Machine - Round Head
	302-0422	1	0-600 VAC, Code 6			(#6-32 x 5/8")	
	302-0779	1	0-750 VAC, Code 9	28	853-0003	4	Washer, Lock - ET (#6)
	302-0718	1	0-300/600 VAC, Code 17, 517	29		Regulator, Voltage (VR21)	
5			Meter, Frequency - Reed (M23)	332-1268	1	120 VAC Input Signal Req'd	
	302-0221	1	230 VAC, 60 Hz - Code 5, 6, 7, 9, 17	332-1956	1	240 VAC Input Signal Req'd	
	302-0256	1	230 VAC, 50 Hz - Code 517	30		Transformer, Voltage (T21)	
6			Meter, Frequency - Pointer (M23)	315-0342	1	120 VAC	
	302-0810	1	208 VAC, 60 Hz - Code 7, 17	315-0431	1	240 VAC	
	302-0811	1	240 VAC, 60 Hz - Code 5, 6, 9	812-0061	2	Screw, Machine - Round Head	
	302-0894	1	240 VAC, 50 Hz - Code 517			(#6-32 x 3/8")	
7			Meter, Totalizing - Time (M24)	853-0003	2	Washer, Lock - ET (#6)	
	302-0466	1	60 Hz	31	305-0675	1	Rectifier, Bridge (CR21)
	302-0469	1	50 Hz	812-0070	2	Screw, Machine - Round Head	
8			Light, Indicator - Red - 125 VAC	850-0020	2	(#6-32 x 1-1/4")	
	322-0130	1	Upper Scale (DS21)	32	315-0384	1	Washer, Lock - Spring (#6)
	322-0131	1	Lower Scale (DS22)	812-0061	2	Reactor (L21)	
9	320-0307	1	Lock, Handle			Screw, Machine - Round Head	
	815-0203	1	Screw, Machine - Round Head	853-0003	2	(#6-32 x 3/8")	
			(#10-32 x 7/8")	33	508-0001	1	Washer, Lock - ET (#6)
	854-0010	1	Washer, Lock - ET (#10)	34	406-0332	2	Grommet
	871-0010	1	Nut, Hex (#10-32)	35	800-0045	4	Receptacle, Fastener
10	320-0455	1	Breaker, Circuit (CB21)			Screw, Cap - Hex Head	
	812-0061	2	Screw, Machine - Round Head	36	850-0045	4	(5/16-18 x 3/8")
			(#6-32 x 3/8")	37	402-0078	4	Washer, Lock - Spring (5/16")
	850-0020	2	Washer, Lock - Spring (#6)	38	337-0049	1	Dampener, Vibration
11	406-0334	2	Clip, Fastener	39	815-0026	3	Strap, Electrical - Ground
12	406-0333	2	Stud, Fastener			Screw, Machine - Truss Head	
13	517-0131	1	Plug, Plastic	40		(#10-32 x 3/8")	
14	303-0076	1	Knob, Pointer			Panel, Control	
15	308-0284	1	Switch, Selector (S21)	301-3342	1	4 Meters, Code 5, 6, 7, 9	
16	303-0032	1	Knob	301-3170	1	4 Meters, Code 17, 517	
17	303-0170	1	Rheostat (R21)	301-3449	1	5 Meters, Code 5, 6, 7, 9	
18	350-0556	1	Resistor (R22)	301-3312	1	5 Meters, Code 17, 517	
19	323-0765	1	Socket, Relay (Less Terminals)	41	301-3158	1	Box, Control
	812-0061	2	Screw, Machine - Round Head	42	350-0098	1	Resistor (3.k Ohms)
			(#6-32 x 3/8")	43	350-0101	1	Resistor (3.9k Ohms)
	853-0003	2	Washer, Lock - ET (#6)	44		Harness, Wiring	
	860-0005	2	Nut, Hex (#6-32)	338-0730	1	Code 17, 517	
	332-1280	11	Terminal	338-0759	1	Code 5, 6, 9	
20	301-3244	1	Bracket, Mounting	338-0916	1	Code 7	
21	870-0053	1	Nut, Hex (#10-32)	45		Current Transformer	
22	850-0030	1	Washer, Lock - Spring (#10)			(See Separate Page for	
23	332-0051	1	Clamp, Loop			Components)	

Generator Control
Switching Regulator
Spec H thru L

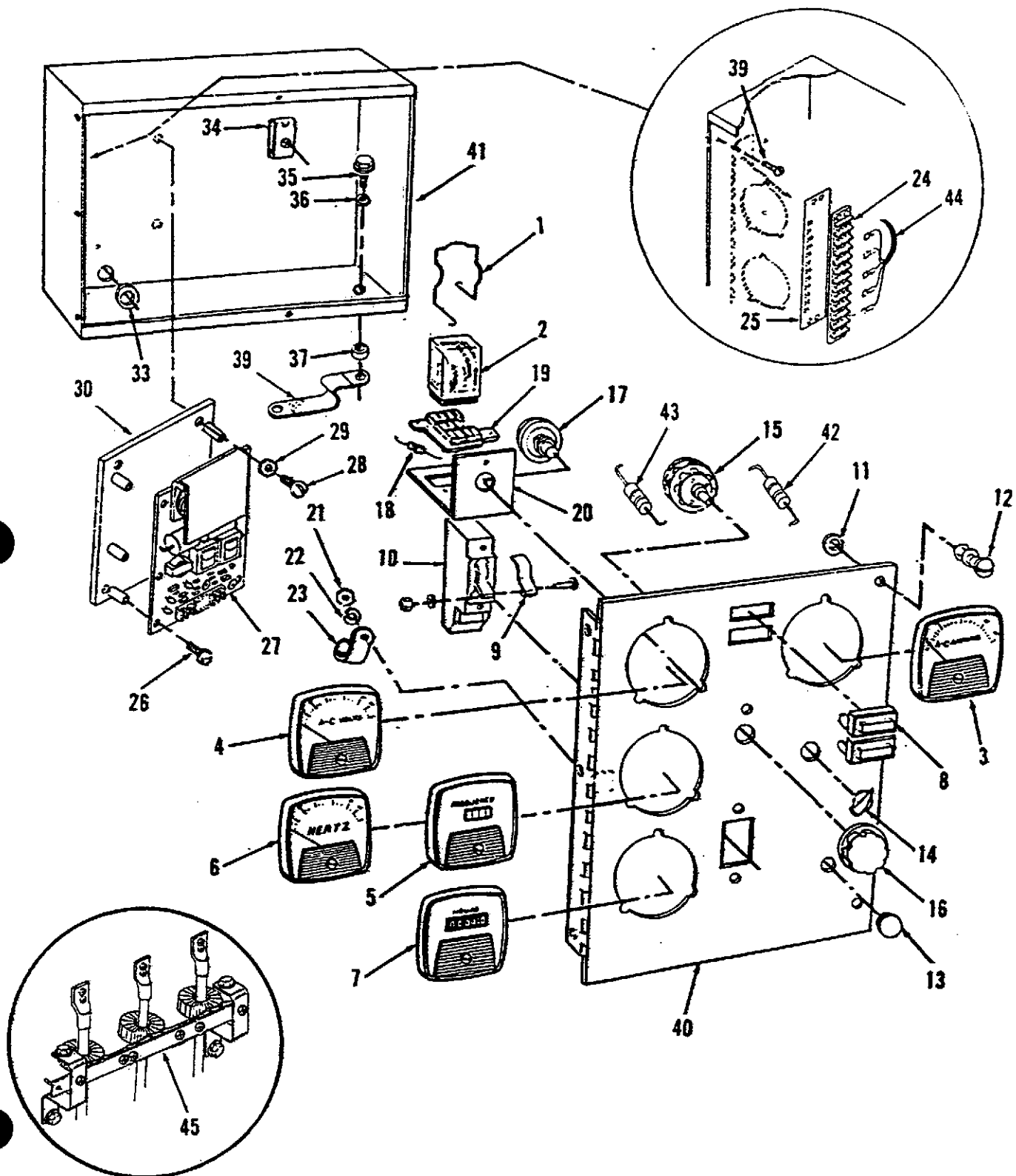


SC1164-2

Generator Control
Switching Regulator
Spec H thru L

REF NO.	PART NO.	QTY USED	PART DESCRIPTION	REF NO.	PART NO.	QTY USED	PART DESCRIPTION
1	307-1157	1	Spring, Relay	20	301-3244	1	Bracket, Mounting
2	307-1061	1	Relay (K21)	21	870-0053	1	Nut, Hex (#10-32)
3			Ammeter (M21)	22	850-0030	1	Washer, Lock - Spring (#10)
	302-0413	1	0-300 Amp, Code 9 - 200kW Set	23	332-0051	1	Clamp, Loop
	302-0605	1	0-400 Amp, Code 6	24			Block, Terminal (T921)
	302-0605	1	0-400 Amp, Code 9 - 230kW Set		332-0607	1	12 Place
	302-0414	1	0-500 Amp, Code 5, 7		332-0795	1	16 Place
	302-0877	1	0-400/800 Amp, Code 517		812-0066	2	Screw, Machine - Round Head (#6-32 x 3/4")
	302-0878	1	0-500/1000 Amp, Code 17				Washer, Lock - ET (#6)
4			Voltmeter (M22)		853-0003	2	Washer, Lock - Spring (#6)
	302-0421	1	0-300 VAC, Code 5		850-0020	2	Strip, Marker
	302-0612	1	0-500 VAC, Code 7	25			16 Place
	302-0422	1	0-600 VAC, Code 6		332-1242	1	12 Place
	302-0779	1	0-750 VAC, Code 9		332-1248	1	12 Place
	302-0718	1	0-300/600 VAC, Code 17, 517	27	812-0065	4	Screw, Machine - Round Head (#6-32 x 5/8")
5			Meter, Frequency - Reed (M23)				Washer, Lock - ET (#6)
	302-0221	1	230 VAC, 60 Hz - Code 5, 6, 7, 9, 17	28	853-0003	4	Regulator, Voltage (VR21)
	302-0256	1	230 VAC, 50 Hz - Code 517	29			Semi-Frequency Sensitive
6			Meter, Frequency - Pointer (M23)		332-1956	1	Voltage Sensitive
	302-0810	1	208 VAC, 60 Hz - Code 7, 17		332-2044	1	Frequency Sensitive
	302-0811	1	240 VAC, 60 Hz - Code 5, 6, 9	30	315-0431	1	Transformer, Voltage (T21)
	302-0894	1	240 VAC, 50 Hz - Code 517		812-0061	2	Screw, Machine - RH
7			Meter, Totalizing - Time (M24)	31	320-0202	1	Bar, Locking
	302-0466	1	60 Hz	32	315-0384	1	Reactor (L21)
	302-0469	1	50 Hz		812-0061	2	Screw, Machine - Round Head (#6-32 x 3/8")
8			Light, Indicator - Red - 125 VAC				Washer, Lock - ET (#6)
	322-0130	1	Upper Scale (DS21)		853-0003	2	Grommet
	322-0131	1	Lower Scale (DS22)	33	508-0001	1	Receptacle, Fastener
9	320-0307	1	Lock, Handle	34	406-0332	2	Screw, Cap - Hex Head (5/16-18 x 3/8")
	815-0203	1	Screw, Machine - Round Head (#10-32 x 7/8")	35	800-0045	4	Washer, Lock - Spring (5/16")
	854-0010	1	Washer, Lock - ET (#10)	36	850-0045	4	Dampener, Vibration
	871-0010	1	Nut, Hex (#10-32)	37	402-0078	1	Strap, Electrical - Ground
10	320-0455	2	Breaker, Circuit (CB21)	38	337-0049	1	Screw, Machine - Truss Head (#10-32 x 3/8")
	812-0061	4	Screw, Machine - Round Head (#6-32 x 3/8")	39	815-0026	3	Panel, Control
	850-0020	4	Washer, Lock - Spring (#6)	40			4 Meters, Code 17, 517
11	406-0334	2	Clip, Fastener		301-6298	1	4 Meters, Code 5, 6, 7, 9
12	406-0333	2	Stud, Fastener		301-6412	1	5 Meters, Code 17, 517
13	517-0131	1	Plug, Plastic		301-8775	1	Box, Control
14	303-0076	1	Knob, Pointer	41	301-3158	1	Resistor (3.k Ohms)
15	308-0284	1	Switch, Selector (S21)	42	350-0098	1	Resistor (3.9k Ohms)
16	303-0032	1	Knob	43	350-0101	1	Harness, Wiring
17	303-0170	1	Rheostat (R21)	44			Code 17, 517
18	350-0556	1	Resistor (R22)		338-0730	1	Code 5, 6, 9
19	323-0765	1	Socket, Relay (Less Terminals)		338-0759	1	Code 7
	812-0061	2	Screw, Machine - Round Head (#6-32 x 3/8")	45	338-0916	1	Current Transformer (See Separate Page for Components)
	853-0003	2	Washer, Lock - ET (#6)				
	860-0005	2	Nut, Hex (#6-32)				
	332-1280	11	Terminal				

Generator Control
Torque Matched Regulator
Spec H thru L

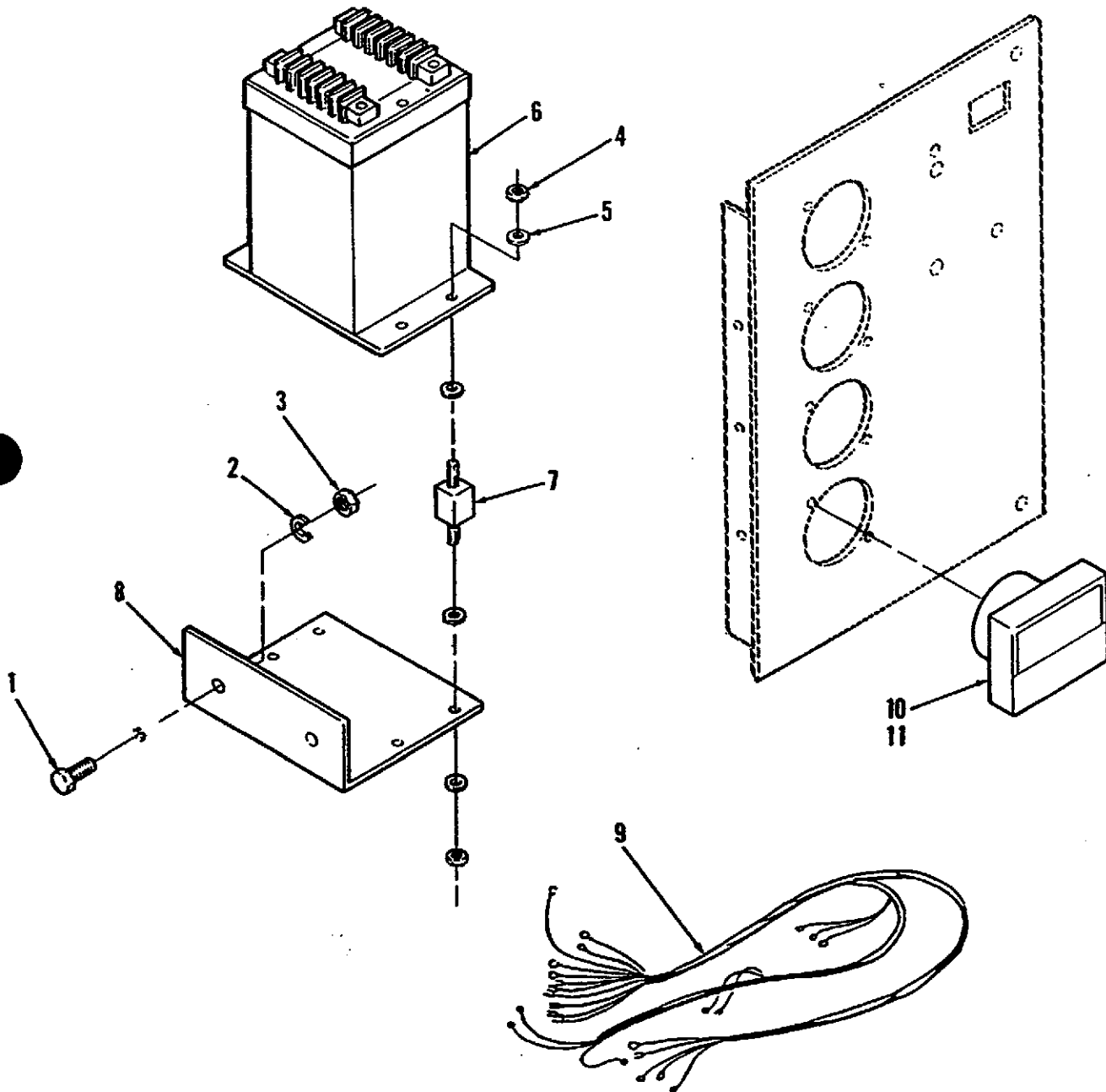
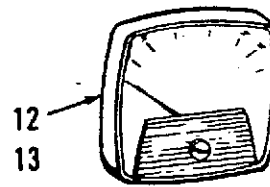


SC1164-3

**Generator Control
Torque Matched Regulator
Spec H thru L**

REF NO.	PART NO.	QTY USED	PART DESCRIPTION	REF NO.	PART NO.	QTY USED	PART DESCRIPTION
1	307-1157	1	Spring, Relay	20	301-3244	1	Bracket, Mounting
2	307-1061	1	Relay (K21)	21	870-0053	1	Nut, Hex (#10-32)
3			Ammeter (M21)	22	850-0030	1	Washer, Lock - Spring (#10)
	302-0413	1	0-300 Amp, Code 9 - 200kW Set	23	332-0051	1	Clamp, Loop
	302-0605	1	0-400 Amp, Code 6	24			Block, Terminal (TB21)
	302-0605	1	0-400 Amp, Code 9 - 230kW Set		332-0607	1	12 Place
	302-0414	1	0-500 Amp, Code 5, 7		332-0795	1	16 Place
	302-0877	1	0-400/800 Amp, Code 517		812-0066	2	Screw, Machine - Round Head (#6-32 x 3/4")
	302-0878	1	0-500/1000 Amp, Code 17				Washer, Lock - ET (#6)
4			Voltmeter (M22)		853-0003	2	Washer, Lock - Spring (#6)
	302-0421	1	0-300 VAC, Code 5		850-0020	2	Strip, Marker
	302-0612	1	0-500 VAC, Code 7	25			16 Place
	302-0422	1	0-600 VAC, Code 6		332-1242	1	12 Place
	302-0779	1	0-750 VAC, Code 9		332-1248	1	12 Place
	302-0718	1	0-300/600 VAC, Code 17, 517	26	815-0544	6	Screw, Machine - Round Head with IT Lock Washer (#6-32 x 1/2")
5			Meter, Frequency - Reed (M23)				Regulator, Voltage (VR21)
	302-0221	1	230 VAC, 60 Hz - Code 5, 6, 7, 9, 17	27	300-2880	1	Screw, Machine - Round Head (#6-32 x 5/8")
	302-0256	1	230 VAC, 50 Hz - Code 517	28	812-0065	4	Washer, Lock - ET (#6)
6			Meter, Frequency - Pointer (M23)				Bracket, Mounting
	302-0810	1	208 VAC, 60 Hz - Code 7, 17	29	853-0003	4	Grommet
	302-0811	1	240 VAC, 60 Hz - Code 5, 6, 9	30	301-9315	1	Receptacle, Fastener
	302-0894	1	240 VAC, 50 Hz - Code 517	33	508-0001	1	Screw, Cap - Hex Head (5/16-18 x 3/8")
7			Meter, Totalizing - Time (M24)	34	406-0332	2	Washer, Lock - Spring (5/16")
	302-0466	1	60 Hz	35	800-0045	4	Dampener, Vibration
	302-0469	1	50 Hz				Strap, Electrical - Gro
8			Light, Indicator - Red - 125 VAC	36	850-0045	4	Screw, Machine - Truss Head (#10-32 x 3/8")
	322-0130	1	Upper Scale (DS21)	37	402-0078	4	Panel, Control
	322-0131	1	Lower Scale (DS22)	38	337-0049	1	4 Meters, Code 5, 6, 7, 9
9			Lock, Handle	39	815-0026	3	4 Meters, Code 17, 517
	815-0203	1	Screw, Machine - Round Head (#10-32 x 7/8")	40			5 Meters, Code 5, 6, 7, 9
	854-0010	1	Washer, Lock - ET (#10)		301-3342	1	5 Meters, Code 17, 517
	871-0010	1	Nut, Hex (#10-32)		301-3170	1	Box, Control
10			Breaker, Circuit (CB21)		301-3449	1	Resistor (3.k Ohms)
	812-0061	2	Screw, Machine - Round Head (#6-32 x 3/8")		301-3312	1	Resistor (3.9k Ohms)
	850-0020	2	Washer, Lock - Spring (#6)	41	301-3158	1	Harness, Wiring
11	406-0334	2	Clip, Fastener	42	350-0098	1	Code 17, 517
12	406-0333	2	Stud, Fastener	43	350-0101	1	Code 5, 6, 9
13	517-0131	1	Plug, Plastic	44			Code 7
14	303-0076	1	Knob, Pointer		338-0730	1	Current Transformer
15	308-0284	1	Switch, Selector (S21)		338-0759	1	(See Separate Page for Components)
16	303-0032	1	Knob	45	338-0916	1	
17	303-0170	1	Rheostat (R21)				
18	350-0556	1	Resistor (R22)				
19	323-0765	1	Socket, Relay (Less Terminals)				
	812-0061	2	Screw, Machine - Round Head (#6-32 x 3/8")				
	853-0003	2	Washer, Lock - ET (#6)				
	860-0005	2	Nut, Hex (#6-32)				
	332-1280	11	Terminal				

Wattmeter

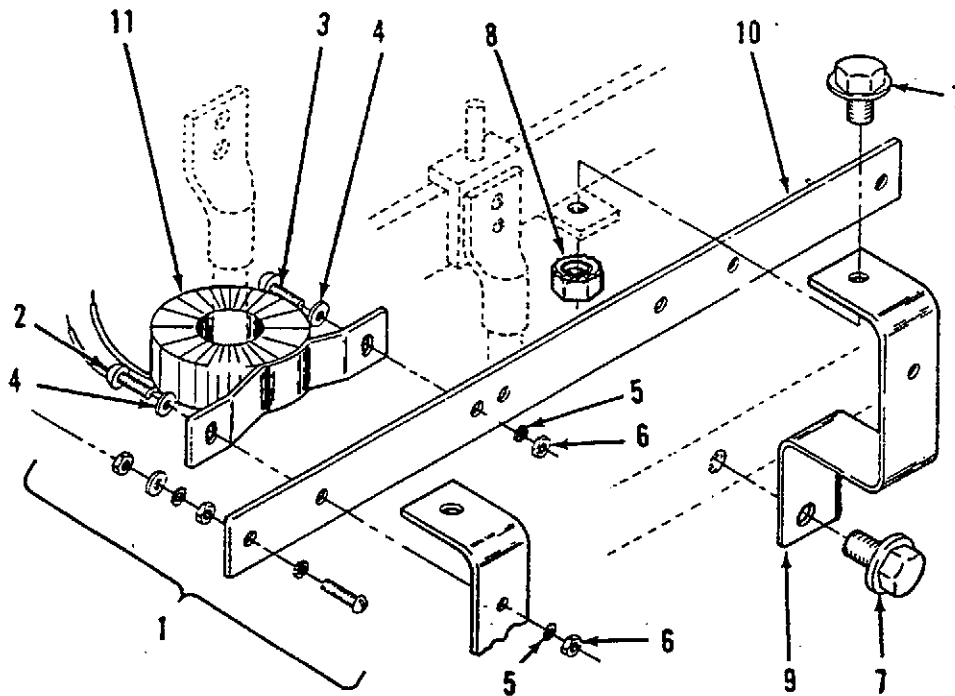


126A.

Wattmeter

REF NO.	PART NO.	QTY USED	PART DESCRIPTION	REF NO.	PART NO.	QTY USED	PART DESCRIPTION
1	821-0017	2	Screw, Self-locking - Hex (5/16-18 x 1/2")	8	301-6987	1	Bracket, Mounting
2	850-0045	2	Washer, Lock - Spring (5/16")	9	338-1936	1	Harness, Wiring
3	862-0014	2	Nut, Hex (5/16-18)	10	302-1722	1	Wattmeter (Less Dial) - Begin Spec M
4	860-0008	8	Nut, Hex (#8-32)	11	302-1721-09	1	Dial (Scale 0-250kW)
5	856-0002	16	Washer, Lock - EIT (#8)	12	302-1102	1	Wattmeter (Less Dial) - Spec H thru L
6	302-1082	1	3 Phase, 60 Hz	13	302-1115	1	Dial(Scale 0-250kW)
	302-1083	1	3 Phase, 50 Hz				
7	402-0078	4	Mount, Vibration				

Current Transformer

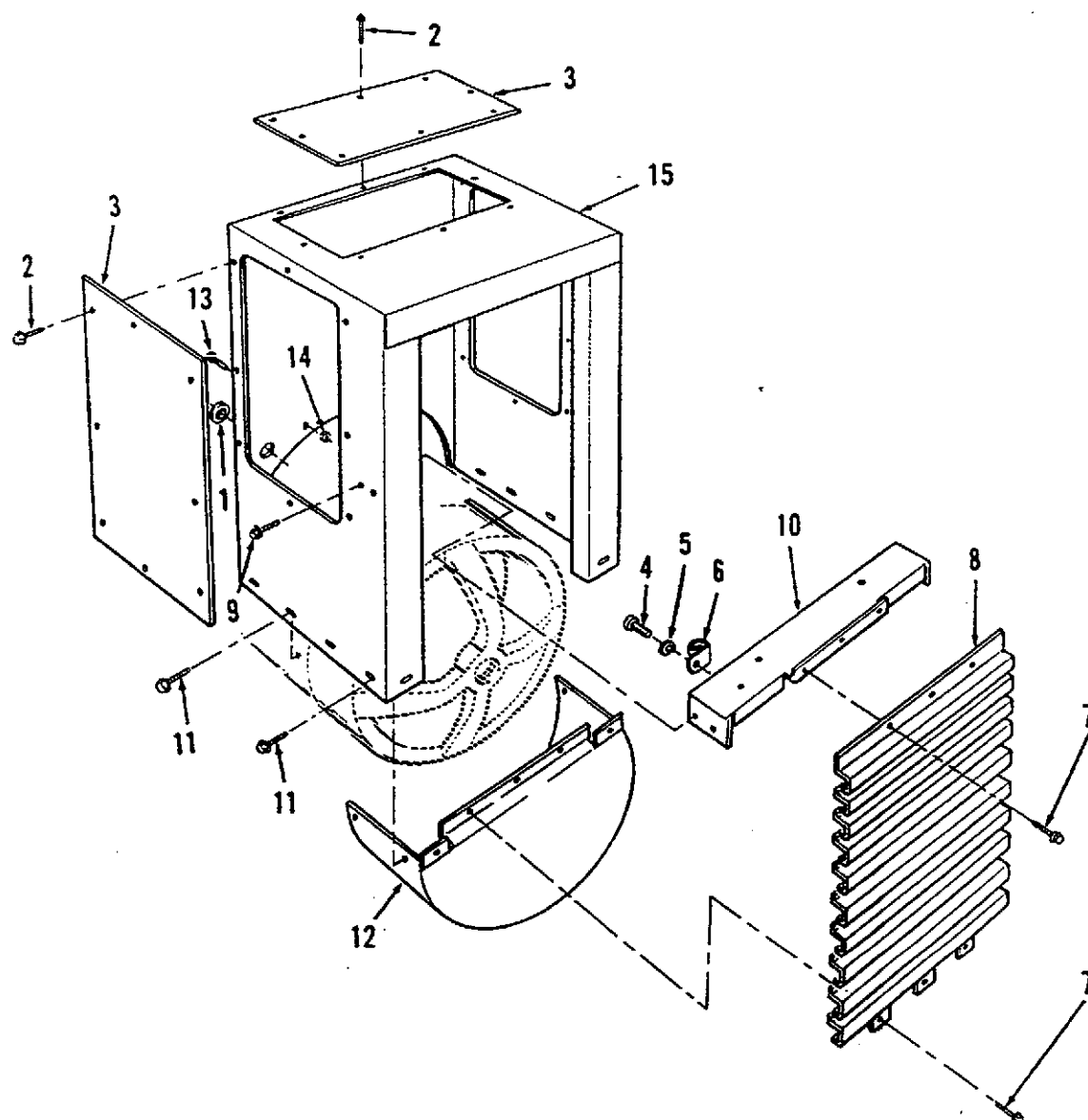


XES-1155

REF NO.	PART NO.	QTY USED	PART DESCRIPTION	REF NO.	PART NO.	QTY USED	PART DESCRIPTION
1	815-0203	1	Terminal, Ground	7	821-0029	4	Screw, Self-locking - Hex (3/8-16 x 3/4")
	871-0010	3	Screw, Machine - Round Head (#10-32 x 7/8")	8	870-0281	4	Nut, Self-locking - Hex (3/8-16)
	856-0003	1	Nut, Hex (#10-32)	9	232-2342	2	Bracket, Mounting
	854-0010	2	Washer, Lock - EIT (#10)	10	315-0389	1	Plate, Mounting
	526-0049	2	Washer, Lock - IT (#10)	11			Transformer, Current with Mounting Feet
2	813-0103	2	Washer, Flat - Brass (#10)		302-0866	3	300/5, 2VA - Code 9X
			Screw, Machine - Round Head (#10-32 x 3/4")		302-0608	3	400/5, 2VA - Code 517
3	813-0100	4	Screw, Machine - Round Head (#10-32 x 1/2")		302-0609	3	400/5, 5VA - Code 6
4	526-0008	6	Washer, Flat (#10)		302-0547	3	500/5, 2VA - Code 7, 17
5	856-0003	6	Washer, Lock - EIT (#10)		302-1090	3	750/5, 5VA - Code 5
6	870-0053	6	Nut, Hex (#10-32)				

* - Parts Included in Ground Terminal.

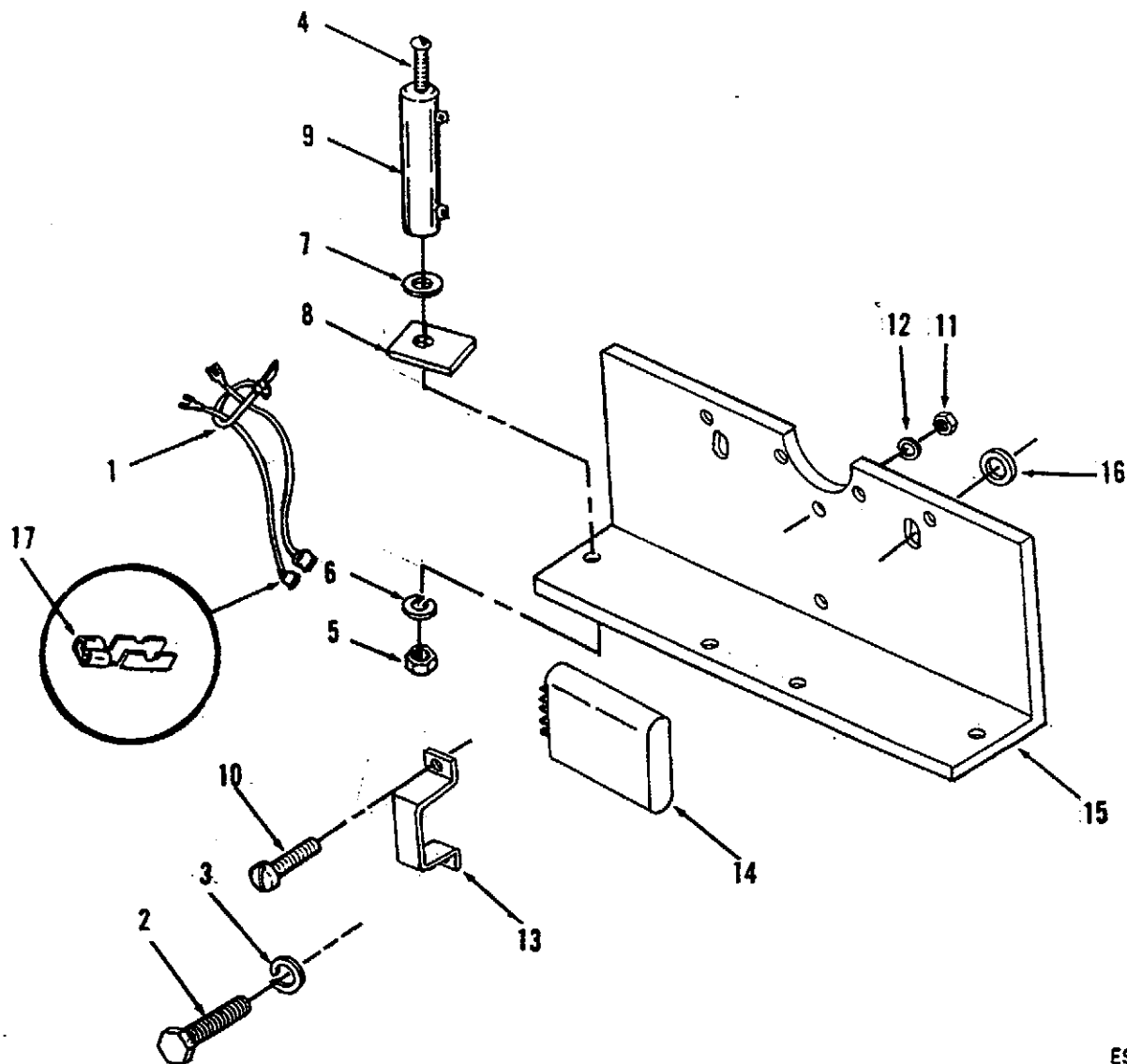
Control Housing



M-1213

REF NO.	PART NO.	QTY USED	PART DESCRIPTION	REF NO.	PART NO.	QTY USED	PART DESCRIPTION
1	508-0203	1	Bushing, Grommet - Used Thru 1984	8	234-0490	1	Grille
	508-0051	1	Begin 1985	9	821-0010	4	Screw, Self-locking - Hex
2	821-0010	24	Screw, Self-locking - Hex (1/4-20 x 1/2")	10	301-3604	1	Shelf
3	301-3731	3	Panel, Access	11	821-0014	10	Screw, Self-locking - Hex (5/16-18 x 1/2")
4	813-0102	1	Screw, Machine - Round Head (#10-32 x 5/8")	12	234-0489	1	Cover, End Bell
5	850-0030	1	Washer, Lock - Spring (#10)	13	821-0016	2	Screw, Self-locking - Hex (5/16-18 x 3/4")
6	332-0052	3	Clamp, Loop	14	870-0257	2	Nut, Self-locking - Hex (5/16-18)
7	821-0010	6	Screw, Self-locking - Hex (1/4-20 x 1/2")	15	301-3605	1	Housing, Control

Voltage Regulator Filter

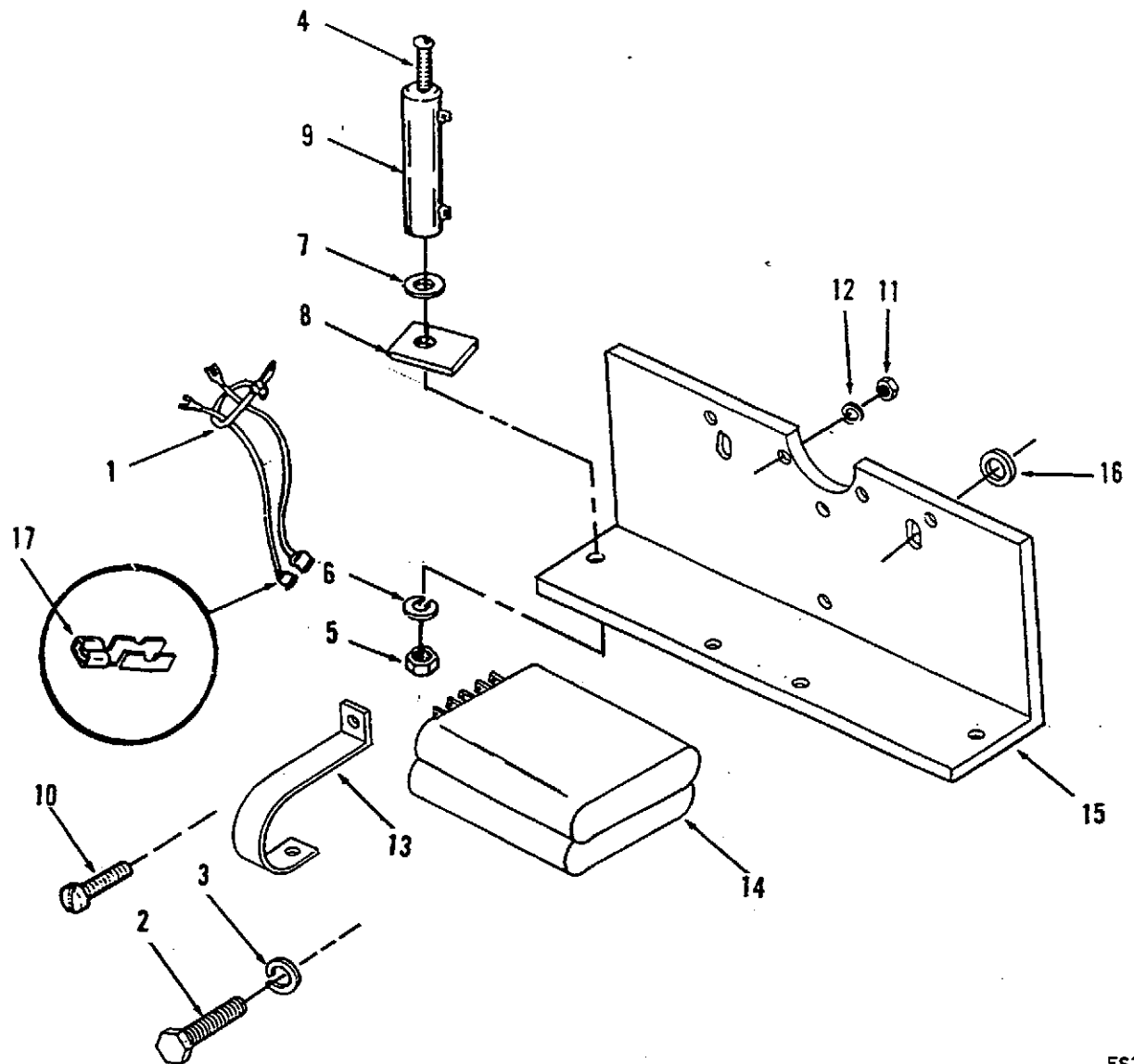


ES1115-1

REF NO.	PART NO.	QTY USED	PART DESCRIPTION
1	332-0941	5	Tie, Cable
2	800-0003	2	Screw, Cap - Hex Head (1/4-20 x 1/2")
3	850-0040	2	Washer, Lock - Spring (1/4")
4	812-0165	2	Screw, Machine - Round Head (1/4-20 x 4-1/2")
5	862-0001	2	Nut, Hex (1/4-20)
6	850-0040	2	Washer, Lock - Spring (1/4")
7	304-0427	2	Washer, Centering
8	304-0292	2	Insulator
9	354-0025	1	Resistor

REF NO.	PART NO.	QTY USED	PART DESCRIPTION
10	813-0098	2	Screw, Machine - Round Head (#10-32 x 3/8")
11	870-0053	2	Nut, Hex (#10-32)
12	850-0030	2	Washer, Lock - Spring (#10)
13	312-0189	1	Bracket, Mounting
14	312-0188	1	Capacitor
15	232-2218	1	Bracket
16	526-0018	15	Washer, Flat (1/4")
17	332-0529	4	Terminals Bare
	332-1279	8	Terminals Insulated

Voltage Regulator Filter Heavy Duty

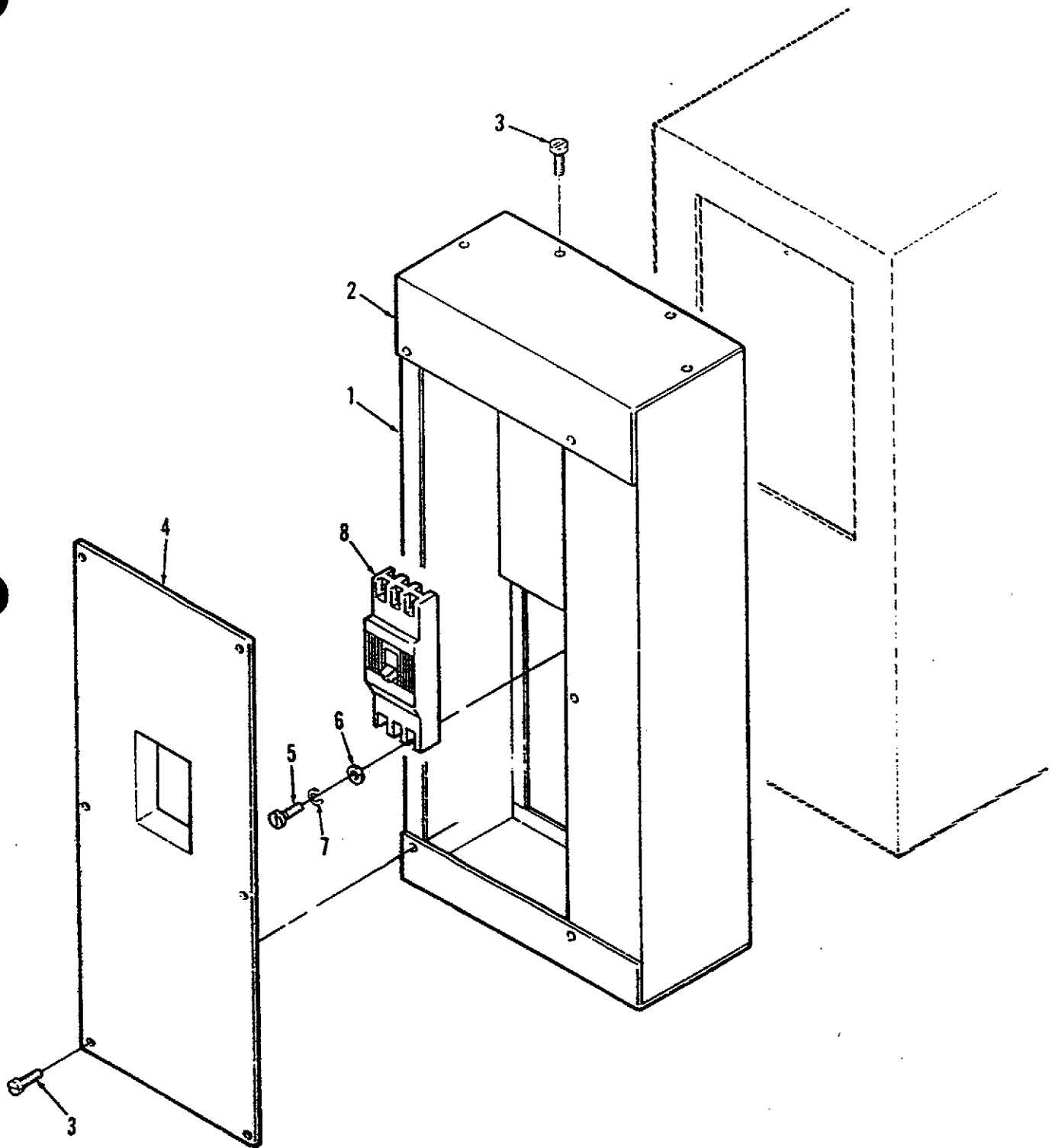


ES1115-2

REF NO.	PART NO.	QTY USED	PART DESCRIPTION
1	332-0941	5	Tie, Cable
2	800-0003	2	Screw, Cap - Hex Head (1/4-20 x 1/2")
3	850-0040	2	Washer, Lock - Spring (1/4")
4	812-0165	2	Screw, Machine - Round Head (1/4-20 x 4-1/2")
5	862-0001	2	Nut, Hex (1/4-20)
6	850-0040	2	Washer, Lock - Spring (1/4")
7	304-0427	2	Washer, Centering
8	304-0292	2	Insulator
9	354-0025	1	Resistor

REF NO.	PART NO.	QTY USED	PART DESCRIPTION
10	813-0098	4	Screw, Machine - Round Head (#10-32 x 3/8")
11	870-0053	4	Nut, Hex (#10-32)
12	850-0030	4	Washer, Lock - Spring (#10)
13	370-0007	2	Strap, Mounting
14	312-0188	2	Capacitor
15	232-2218	1	Bracket
16	526-0018	15	Washer, Flat (1/4")
17	332-0529	8	Terminals Bare
	332-1279	16	Terminals Insulated

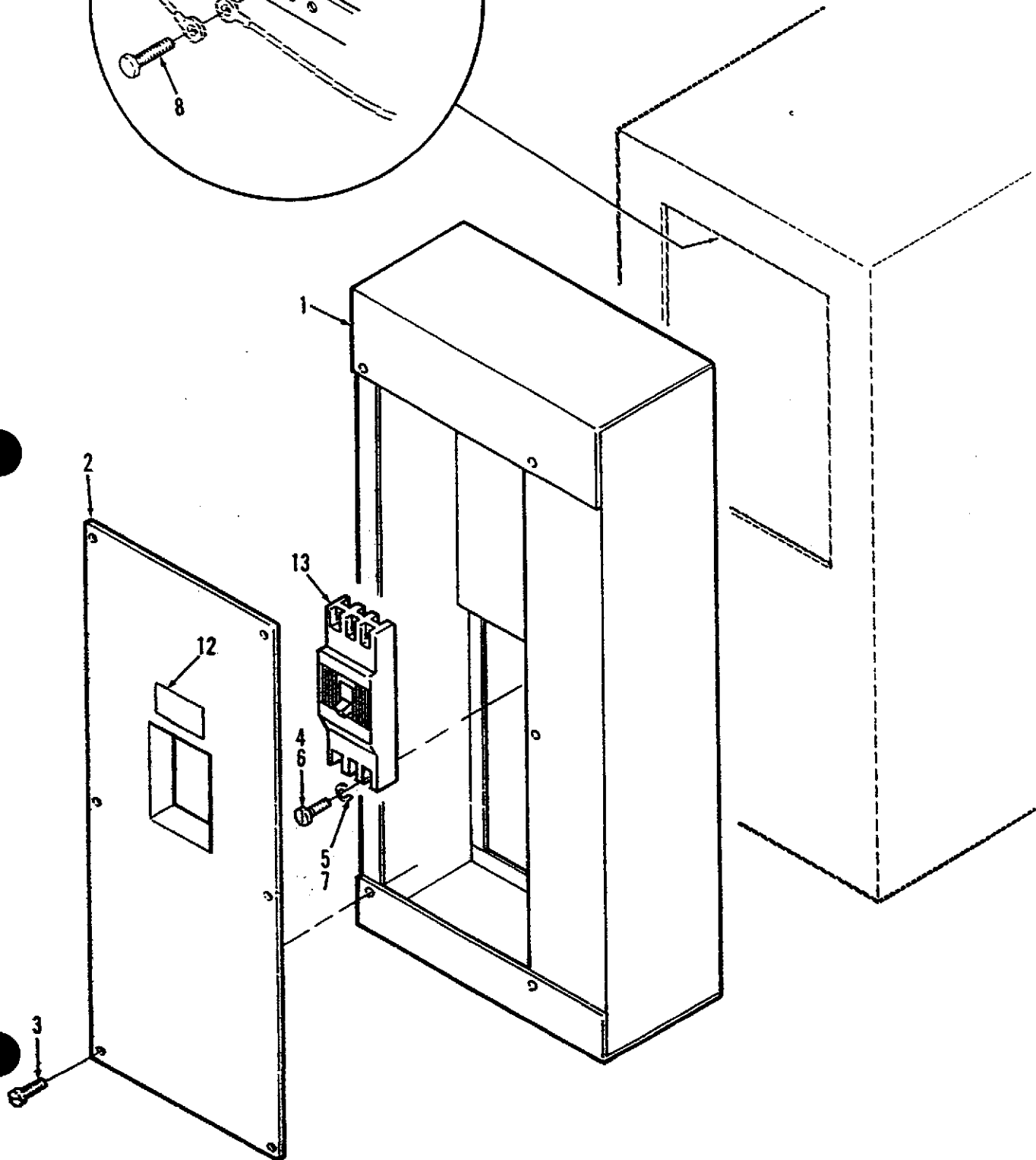
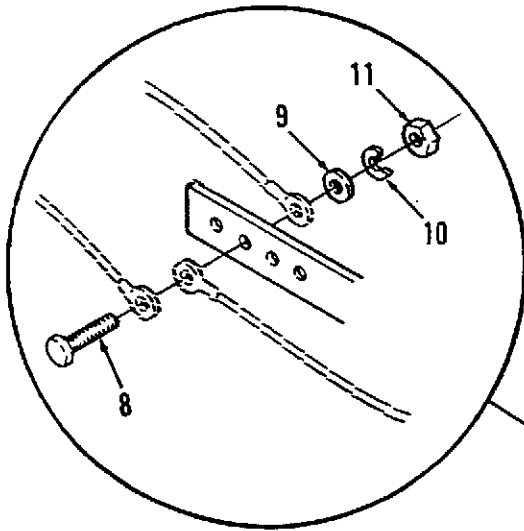
Circuit Breaker
Begin Spec M



Circuit Breaker Begin Spec M

REF NO.	PART NO.	QTY USED	PART DESCRIPTION	REF NO.	PART NO.	QTY USED	PART DESCRIPTION
1	301-9778	1	Box, Breaker				With 240 VAC Shunt Trip
2	301-9779	2	Panel, Breaker	320-1480-06	1	250 Amp	
3	821-0010	8	Screw, Self-locking - Hex (1/4-20 x 1/2")	320-1480-07	1	300 Amp	
4			Cover, Box - Circuit Breaker	320-1480-08	1	350 Amp	
	301-9781	1	3" x 4" Breaker Hole	320-1480-09	1	400 Amp	
	301-9793	1	2-1/2" x 3-5/8" Breaker Hole	320-1480-12	1	600 Amp	
5			Screw, Mounting	320-1481-07	1	700 Amp	
	812-0094	4	225 Amp Breaker				With 480 VAC Shunt Trip
	812-0157	4	250 - 600 Amp Breaker	320-1484-06	1	250 Amp	
	800-0031	4	700 - 1200 Amp Breaker	320-1484-07	1	300 Amp	
6			Washer, Flat	320-1484-08	1	350 Amp	
	526-0048	4	225 Amp Breaker	320-1484-09	1	400 Amp	
	526-0108	4	250 - 600 Amp Breaker	320-1484-12	1	600 Amp	
	526-0115	4	700 - 1200 Amp Breaker	320-1485-07	1	700 Amp	
7			Washer, Lock				With 12 VDC Shunt Trip & Auxiliary Contacts
	850-0025	4	225 Amp Breaker	320-1488-06	1	250 Amp	
	850-0040	4	250 - 600 Amp Breaker	320-1488-07	1	300 Amp	
	850-0045	4	700 - 1200 Amp Breaker	320-1488-08	1	350 Amp	
8			Breaker, Circuit - 3 Phase	320-1488-09	1	400 Amp	
			Standard	320-1488-12	1	600 Amp	
	320-1460-06	1	250 Amp	320-1489-07	1	700 Amp	
	320-1460-07	1	300 Amp				With 24 VDC Shunt Trip & Auxiliary Contacts
	320-1460-08	1	350 Amp	320-1491-06	1	250 Amp	
	320-1460-09	1	400 Amp	320-1491-07	1	300 Amp	
	320-1460-12	1	600 Amp	320-1491-08	1	350 Amp	
	320-1461-07	1	700 Amp	320-1491-09	1	400 Amp	
			With Auxiliary Contacts	320-1491-12	1	600 Amp	
	320-1464-06	1	250 Amp	320-1492-07	1	700 Amp	
	320-1464-07	1	300 Amp				With 120 VAC Shunt Trip & Auxiliary Contacts
	320-1464-08	1	350 Amp	320-1495-06	1	250 Amp	
	320-1464-09	1	400 Amp	320-1495-07	1	300 Amp	
	320-1464-12	1	600 Amp	320-1495-08	1	350 Amp	
	320-1465-07	1	700 Amp	320-1495-09	1	400 Amp	
			With 12 VDC Shunt Trip	320-1495-12	1	600 Amp	
	320-1468-06	1	250 Amp	320-1496-07	1	700 Amp	
	320-1468-07	1	300 Amp				With 240 VAC Shunt Trip & Auxiliary Contacts
	320-1468-08	1	350 Amp	320-1500-06	1	250 Amp	
	320-1468-09	1	400 Amp	320-1500-07	1	300 Amp	
	320-1468-12	1	600 Amp	320-1500-08	1	350 Amp	
	320-1469-07	1	700 Amp	320-1500-09	1	400 Amp	
			With 24 VDC Shunt Trip	320-1500-12	1	600 Amp	
	320-1472-06	1	250 Amp	320-1501-07	1	700 Amp	
	320-1472-07	1	300 Amp				With 480 VAC Shunt Trip & Auxiliary Contacts
	320-1472-08	1	350 Amp	320-1504-06	1	250 Amp	
	320-1472-09	1	400 Amp	320-1504-07	1	300 Amp	
	320-1472-12	1	600 Amp	320-1504-08	1	350 Amp	
	320-1473-07	1	700 Amp	320-1504-09	1	400 Amp	
			With 120 VAC Shunt Trip	320-1504-12	1	600 Amp	
	320-1476-06	1	250 Amp	320-1505-07	1	700 Amp	
	320-1476-07	1	300 Amp				
	320-1476-08	1	350 Amp				
	320-1476-09	1	400 Amp				
	320-1476-12	1	600 Amp				
	320-1477-07	1	700 Amp				

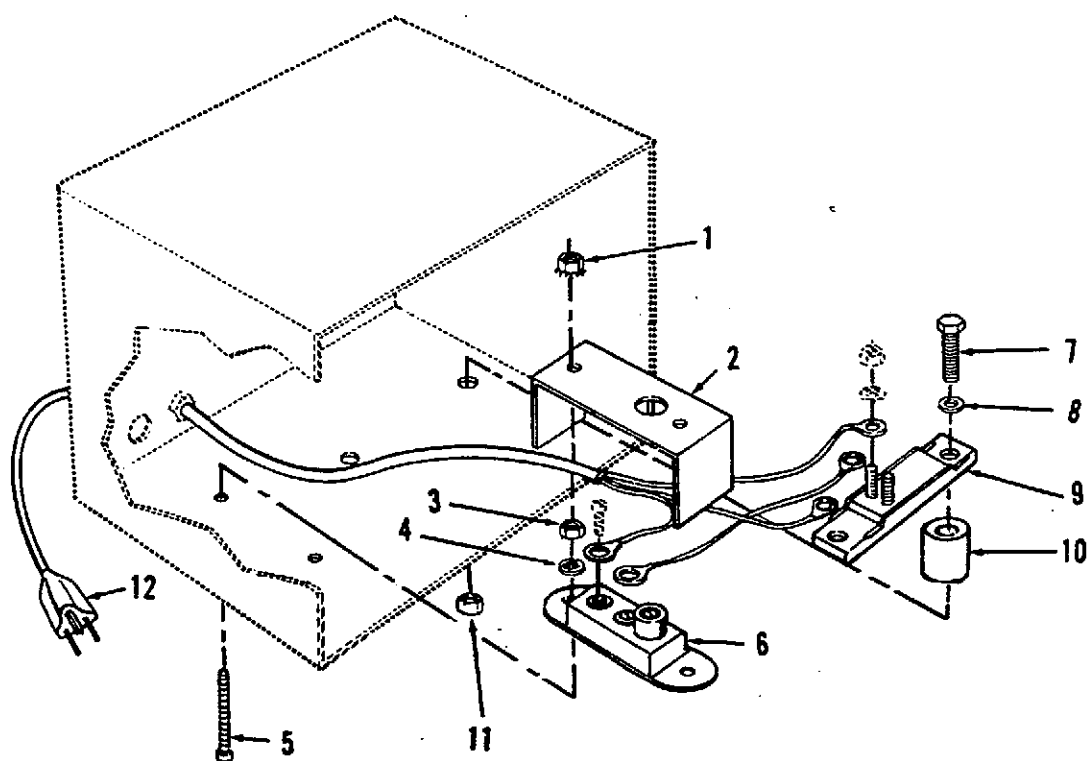
Circuit Breaker
Spec H thru L



Circuit Breaker Spec H thru L

REF NO.	PART NO.	QTY USED	PART DESCRIPTION	REF NO.	PART NO.	QTY USED	PART DESCRIPTION
1	301-3728	1	Box, Breaker				With Auxiliary Contacts
2	301-9139	1	Cover, Breaker		320-0741	1	300 Amp
3	815-0026	6	Screw, Machine - Truss Head (#10-32 x 3/8")		320-0730	1	400 Amp
4	812-0156	4	Screw, Machine - Round Head (1/4-20 x 1/2")		320-1305	1	600 Amp
5	850-0040	4	Washer, Lock (1/4")		320-1562	1	800 Amp
6	812-0182	4	Screw, Machine - Round Head (5/16-18 x 1-1/2")		320-0370	1	With 12 VDC Shunt Trip
7	850-0045	4	Washer, Lock (5/16)		320-0387	1	300 Amp
8	800-0071	8	Screw, Cap - Hex Head (7/16-14 x 1")		320-0245	1	400 Amp
9	526-0141	8	Washer, Flat (7/16")		320-0267	1	500 Amp
10	850-0055	8	Washer, Lock (7/16")		320-0438	1	600 Amp
11	862-0004	8	Nut, Hex (7/16-14)		320-0524	1	With 24 VDC Shunt Trip
12	98-2304	1	Silkscreen, Circuit Breaker (Warning)		320-0429	1	300 Amp
13			Breaker, Circuit - 3 Pole - Standard		320-0403	1	400 Amp
	320-0445	1	250 Amp		320-0432	1	500 Amp
	320-0401	1	300 Amp		320-0436	1	600 Amp
	320-0523	1	350 Amp		320-0466	1	700 Amp
	320-0405	1	400 Amp				800 Amp
	320-0598	1	500 Amp		320-0268	1	With 120 VAC Shunt Trip
	320-0599	1	600 Amp		320-0275	1	300 Amp
	320-0528	1	700 Amp		320-0236	1	350 Amp
	320-0519	1	800 Amp		320-0386	1	500 Amp
					320-0331	1	600 Amp
					320-0279	1	With 480 VAC Shunt Trip
					320-0398	1	300 Amp
					320-0338	1	350 Amp
							500 Amp
							600 Amp

Control Heater



SC1156

REF NO.	PART NO.	QTY USED	PART DESCRIPTION
1	870-0183	2	Nut, Self-locking - Hex (#6-32)
2	301-1886	1	Cover
3	860-0006	1	Nut, Hex (#6-32)
4	854-0006	2	Washer, Lock - IT (#6)
5	812-0070	2	Screw, Machine - Round Head (#6-32 x 1-1/4")
6	309-0128	1	Thermostat, Adjustable

REF NO.	PART NO.	QTY USED	PART DESCRIPTION
7	800-0034	2	Screw, Cap - Hex Head (5/16-18 x 2-1/4")
8	526-0113	2	Washer, Flat (5/16")
9	333-0151	1	Heater, Electrical
10	130-1107	2	Spacer
11	870-0257	2	Nut, Self-locking - Hex (5/16-18)
12	335-0161	1	Cable, Electrical

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